WESTERN BIRDS

Vol. 21, No. 1, 1990

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WESTERN BIRDS

Quarterly Journal of Western Field Ornithologists

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Published September 28, 1990 ISSN 0045-3897

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Full page	4 x 6¾ inches	$60 per issue	$200 per year
Half Page	4 x 3⅜ inches	$40 per issue	$130 per year
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WESTERN BIRDS

Volume 21, Number 1, 1990

BREEDING DISTRIBUTION OF THE BLACK SWIFT IN SOUTHERN CALIFORNIA

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The Black Swift (*Cypseloides niger*) is sparsely distributed over wide portions of western North America from British Columbia and southwestern Alberta south to southern California and east to Colorado (A.O.U. 1983). Elsewhere its range includes Mexico, Central America south to Costa Rica, and the Greater Antilles. Within this range, it has a discontinuous distribution, with nests found on sea cliffs (Vrooman 1901), in sea caves (Legg 1956), behind mountain waterfalls (Smith 1928, Knorr 1962), on moist inland cliffs (Michael 1927), and in limestone caves (Davis 1964). The winter range of the migratory population in western North America is presumed to be southern Mexico (Friedmann et al. 1950).

The nest and egg of the Black Swift were discovered by A.G. Vrooman (1901) along a sea cliff west of Santa Cruz, California. Vrooman, an amateur egg collector, was searching for cormorant eggs along the cliff when "suddenly, right from under the pole and not more than three or four feet from my hand, a Black Swift flew out and down toward the water and passed around the angle toward the ocean." The nest was situated in a small crevice lined with mud and tufts of grass. Even though a second nest was found four years later (Vrooman 1905), the record was subject to widespread skepticism from within the ornithological community. It was not until 1915 that the record was widely accepted, following a visit to the site and a subsequent apology from W. L. Dawson (1915) in an article entitled "The Nesting of the Black Swift—A Vindication." Subsequently, Black Swifts were also found breeding inland behind waterfalls (Michael 1927, Smith 1928).

Knorr (1961) conducted a 10-year survey of the geographical distribution of Black Swifts in Colorado and proposed a set of ecological requirements for Black Swift breeding. Even so, there has been a notable absence of surveys in other parts of the species' range of the distribution of nest sites and comparisons with Knorr's proposed nest-site requirements. In this study we examine the characteristics of breeding sites and the population size of Black Swifts breeding in southern California.

METHODS

Field work was conducted from March to early September in 1985 and from late April to early September in 1986, which included the period of residency of Black Swifts in the area. Black Swifts occur in southern California between April and October with the extreme dates representing the passage of migrants (Garrett and Dunn 1981). The breeding period, from egg laying to fledging, is from May to September (Foerster 1987, Collins and Foerster unpubl. data). We conducted our field surveys in the San Gabriel, San Bernardino, and San Jacinto Mountains of southern California (Figure 1). Each potential nesting site was rated according to the presence or absence of Black Swifts and Knorr's (1961) ecological criteria. Detailed descriptions of all confirmed nest site localities examined in this study, along with their elevations and ecological features are presented below. The locations of all potential nest sites where Black Swifts were not detected during this study are listed in Appendix 1.

RESULTS AND DISCUSSION

Distribution

Within southern California, the Black Swift is a local and restricted breeder. Hall (1948) reported the first Black Swift nest in southern California near Hemet, Riverside County. Other previously known nesting sites are Sturtevant Falls in the San Gabriel Mountains (McCaskie 1974, Remsen 1978), Big Falls in the San Bernardino Mountains (McCaskie 1969, Remsen 1978), and on the lower North Fork of the San Jacinto River (Collins and Sheppard unpubl. data). Over the two seasons of this study, we surveyed 50 separate waterfalls and found Black Swifts nesting at six sites (Figure 1). All sites were located in mountain canyons with riparian habitat along the streams. The sites are as follows:

1. Sturtevant Falls—The falls are located in Santa Anita Canyon at a top elevation of 645 meters, approximately 15 km northeast of downtown Los Angeles. Water flows year round over the 20-meter falls. The plant communities in this area are Chamise Chaparral and Scrub Oak Chaparral (Hanes 1976). A single nest was situated on the south side of the falls, approximately 7 meters above the base. Since the early 1970s, periodic surveys have revealed from one to three pairs of swifts present during the nesting season, although only a single nest was located in any of these years (Collins unpubl. data).

2. Wolfskill Falls—This site is located in Wolfskill Canyon within the San Dimas Experimental Forest at a top elevation of approximately 550 meters. This area is protected and regulated by the Forest Service of the United States Department of Agriculture. Water flows year round over a series of three waterfalls. The largest (20-meter) and highest upstream fall served as the nesting site. A single nest was located on the north side of the fall, about 4 meters above the base. The major plant communities in the area are Chamise Chaparral and Scrub Oak Chaparral. The herbaceous vegetation in the immediate vicinity of the site consists primarily of monkeyflower (*Mimulus*

cardinalis). A freshwater alga, *Vaucheria* sp., dominates the rock surfaces of the waterfall.

3. Big Falls—This site is located about 2.5 km northeast of Forest Home in the San Bernardino Mountains at a top elevation of 1950 meters. The water flows year round, as this stream is a major snow melt drainage for the southwest side of Mount San Gorgonio. The plant communities in this area are Western Coniferous Forest and Mixed Chaparral (Minnich 1976). Hazardous falling rock and sheer inaccessibility limited the study to the lowest of five waterfalls that drop 150 meters into Mill Creek Canyon. The single nest found was located in a small crevice 10 meters high on the east side of the falls.

4. Lawler Falls—These previously unnamed falls are located 150 meters downstream from the crossing of Highway 243 over the North Fork of the San Jacinto River. The elevation at the top of the falls is approximately 1620 meters. The water flows year round over and behind several large boulders

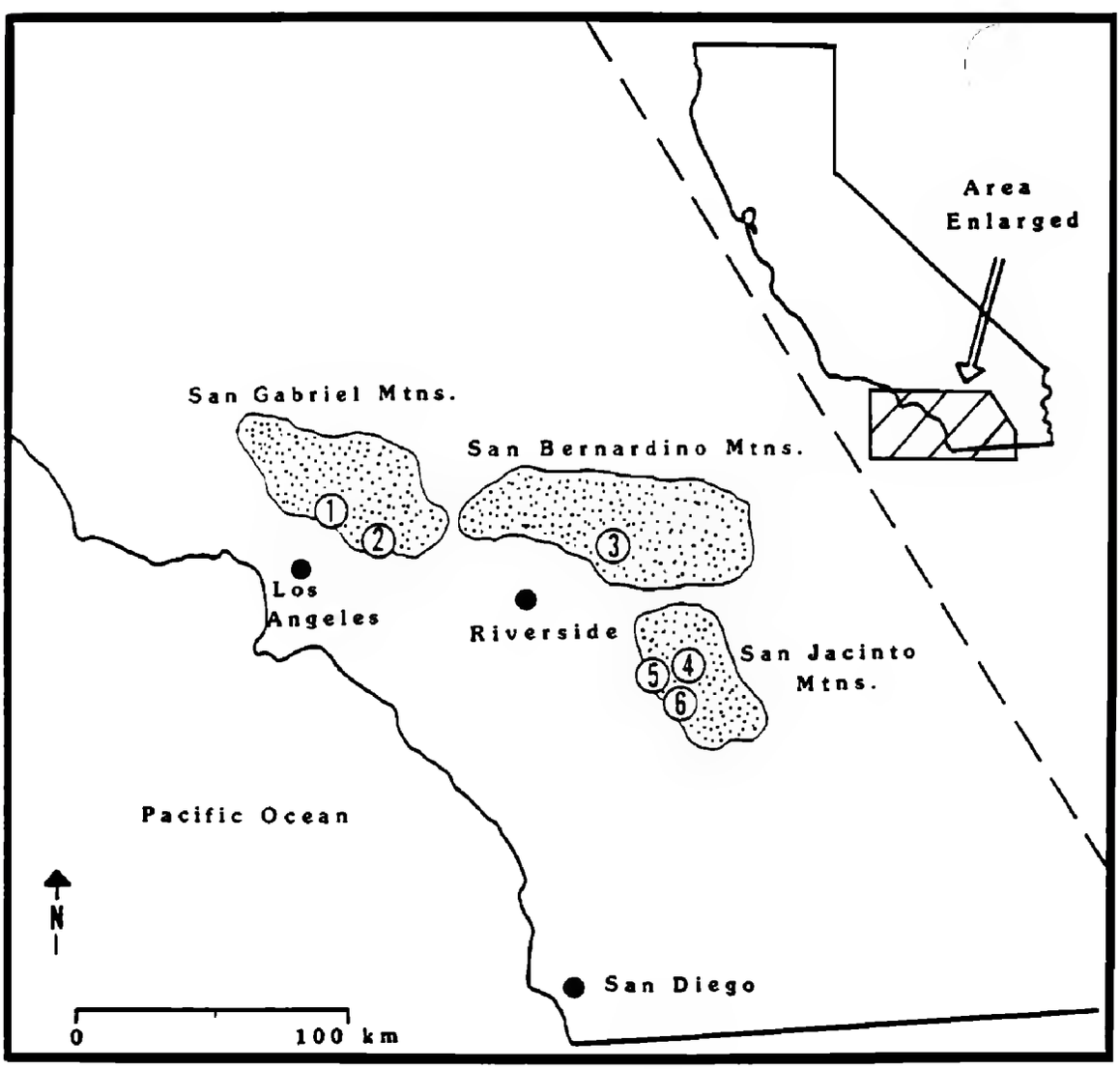

Figure 1. Locations of Black Swift breeding sites in the southern California mountains. 1, Sturtevant Falls; 2, Wolfskill Falls; 3, Big Falls; 4, Lawler Falls; 5, Four Falls; 6, Strawberry Grotto. The stippled area indicates the general outline of the mountain ranges.

wedged into the bottom of the canyon. The placement of the boulders creates a waterfall 8 meters high with a cave 10 meters deep. A minimum of seven pairs of Black Swifts nested in 1985 and again in 1986. The surrounding vegetation is Mixed Conifer Forest dominated by Coulter Pine (*Pinus coulteri*) and Ponderosa Pine (*P. ponderosa*).

5. Four Falls—This site is located on the North Fork of the San Jacinto River approximately 8 km downstream from Lawler Falls at a top elevation of 755 meters. It consists of a series of four waterfalls on property of the Lake Hemet Municipal Water District. The falls range in height from 3 to 15 meters. The one probable nest site was located near the upper falls in 1971 (Collins and Sheppard unpubl. data) and in 1985 (this study). The plant community near this west-facing slope is Chamise Chaparral (Vogl 1976). A large grotto with numerous ferns can be found near the middle falls. This may be the same area described by Hall (1948). Several nests were photographed here in the 1950s (D. Bleitz pers. comm.).

6. Strawberry Grotto—This site is located 1.5 km downstream from the crossing of Tollgate Road over Strawberry Creek in Idyllwild. The top elevation of the falls is approximately 1402 meters. The water flows through a hole between two overhanging boulders that create a small cave. This fall is subject to wide fluctuations in water quantity, but generally the flow is year-round (M. Hamilton pers. comm.). The plant community in this area is Manzanita Chaparral (Vogl 1976). We found single nests in two different locations in 1985 and 1986. Grinnell (1908) first reported seeing Black Swifts flying in Strawberry Valley in the early 1900s. However, no nests were located in the area until our study. Strawberry Grotto is the southernmost known breeding site of Black Swifts in California.

Habitat Characteristics

We surveyed a total of 50 waterfalls in southern California for the presence or absence of five ecological features. These are summarized from Knorr (1961) as follows:

1. Water. Water is present at every nesting site, varying in degree from a rushing torrent to a mere trickle.
2. High relief. The nesting site must have a commanding position above the surrounding terrain so that swifts flying out from the nest are automatically at potential foraging altitude above the surrounding valley.
3. Inaccessibility. The site must be inaccessible to terrestrial marauders and accessible only to winged animals or humans with climbing gear.
4. Darkness. The nest is in a position such that the sun will not shine on an occupied nest.
5. Unobstructed Flyways. The flyway in front of the nest must be free of obstructions.

All six nesting sites had the five ecological requirements. Fifty-six percent of all the waterfalls surveyed had all five requirements (Table 1).

While all of Knorr's five ecological requirements were met by the southern California nest sites, these requirements do not completely describe all nest sites throughout the range of the Black Swift. The presence of water may be the most crucial feature, as no nests are known from intermittent streams. Knorr (1961) suggested the high relief requirement because all of the nesting

Table 1 Number of Ecological Requirements[a] Met at Sites Searched for Nesting Black Swifts

	Number of Requirements Met				
	5	4	3	2	1-0
Unoccupied sites $n=44$	22	10	4	1	7
Occupied sites $n=6$	6	0	0	0	0
Total	28	10	4	1	7
Percentage of total	56%	20%	8%	2%	14%

[a]From Knorr (1961); see text.

sites within his survey were above 7200 feet (2000 meters) in the Colorado Rockies. The high relief requirement may not apply to coastal sea cave nests, but was more typical of the mountain sites examined in this study. Inaccessibility of nests varied from some being reachable only by a high-exposure rappel, to others being within an arm's reach of the base of the falls. The absolute darkness requirement may be less important, as some nests in Montana were in direct sunlight during part of the day (Hunter and Baldwin 1962). However, all the nests in southern California were shaded from direct sunlight, although at least two were only lightly shaded and therefore not in deep darkness. An unobstructed flyway, other than in the immediate vicinity of the nest, appears to be the least important requirement. Black Swifts at Lawler Falls and Sturtevant Falls routinely flew through a maze of tree branches when approaching or leaving the vicinity of the waterfalls.

Many of the falls surveyed in this study (Appendix 1) did not appear to have nesting Black Swifts present even though the majority met the ecological requirements of Knorr (1961). Some clearly lacked a suitable ledge or shelf to support a nest, and this most likely contributed to the absence of nesting at these sites. It was not always obvious why others were not utilized. Even so, potential waterfall nest sites are not abundant and may represent a limiting resource for this species in this part of its range.

Breeding Population Estimates

We found that Black Swifts forage on the wing all day and return to the nest at dusk. By standing at the base of the waterfalls, we could count the number of arrivals and departures. Through numerous early evening waterfall watches and direct observation of nests, we were able to obtain an estimate of the breeding population. The number of adults seen in the survey area was 30 in 1985 and 32 in 1986. However, these population estimates span the entire length of the breeding season and may include counts of some migrating swifts. For example, nine adult swifts were seen during the early season (May) at Sturtevant Falls. A mid-season census (July) revealed only four swifts present on two occasions. Therefore, only adults present dur-

Table 2 Estimated Population of Black Swifts at Southern California Sites

Location	Adults		Nestlings[a]	
	1985	1986	1985	1986
Sturtevant Falls	4	4	0	1
Wolfskill Falls	2	2	1	1
Big Falls	4	4	*b*	*b*
Lawler Falls	14	14	7	6
Four Falls	2	*b*	*b*	*b*
Strawberry Grotto	2	2	1	0
Totals	28	26	9	8

[a]Black Swifts lay a single egg per nesting attempt.
[b]Nest or nest site inaccessible.

ing the mid-season censuses are included in the breeding population estimates (Table 2). The breeding population remained constant during the 2-year study with over 50% of the adults nesting within the San Jacinto Mountains.

The breeding success of the nesting pairs surveyed in this study appeared to be very high (Foerster 1987, Collins and Foerster unpubl. data) even when there was substantial human activity nearby. Therefore, it seems unlikely that the Black Swift population in southern California is only marginally successful and thus unable to increase through natural recruitment. The alternative explanation for the low population size of Black Swifts in southern California is a lack of suitable nesting sites. Our continuing monitoring of the population size and reproductive success of these swifts will help to test this hypothesis.

ACKNOWLEDGMENTS

Connie Boardman, Ray Bransfield, Tad Bodeman, Scott Chestnut, Shirley Critchfield, Maureen Foerster, Gayle Hoffman, John Hooper, Kathy Keane, Victor Lopez, Beverly McIntosh, Todd Pappas, Steve Posson, and William Schew provided valuable field assistance. We are particularly indebted to Michael Hamilton of the University of California in Riverside for allowing us to use the James Reserve as a research base for two years. We are grateful to the U.S.D.A. Forest Service, the Tribal Council of the Agua Caliente Band of the Cahuilla Indians, the Riverside Country Parks Department, the Desert Water Agency, and the Lake Hemet Water District for allowing access to the waterfall sites. Ray Bransfield provided useful comments on an early draft of the manuscript. The final manuscript was improved by the helpful criticism of Kimball Garrett and Philip Unitt. Financial assistance was generously provided by the El Dorado Chapter of the National Audubon Society and Marguerite Foerster.

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Accepted 20 December 1989

APPENDIX 1. Survey sites where Black Swifts were not detected in the southern California mountains during 1985 and 1986. The format is as follows: waterfall name, location, top elevation, height, falls direction, and notes if any; n/a, not available.

San Gabriel Mountains

(1) Bonita Falls; 2 km SW of Lytle Creek Ranger Station on an unnamed creek; 1030 m; 25 m; N.

(2) Bouquet Canyon Falls; 2 km SW of Bouquet Reservoir on Bouquet Canyon Creek; n/a; 3 m; SW.

(3) Castaic Creek Falls. 7 km NW of Castaic Lake on Castaic Creek; n/a; n/a; n/a.

(4) Cooper Canyon Falls; 2 km N of Kratka Ridge on Cooper Canyon Creek; 1725 m; 10 m; NE.

(5) Cucamonga Canyon Falls; 3.5 km SW of Cucamonga Peak; 1300 m; n/a; SW.

(6) Daggar Falls; 3 km S of Magic Mountain in Daggar Canyon; n/a; n/a; n/a; flows only after a storm.

(7) Lower Devils Canyon Falls; 4.5 km N of Cogswell Reservoir in Devils Canyon; 1000 m; n/a; S.

(8) Upper Devils Canyon Falls; 2 km S of Waterman Mountain in Devils Canyon; 1750 m; n/a; S.

(9) Devils Gulch Falls; 2 km NE of Rattlesnake Peak on Devils Gulch Creek; 910 m; 10 m; E.

(10) Eaton Falls; 1 km NE of Altadena in Eaton Canyon; 420 m; 10 m; N.

(11) Fall Creek Falls (Big Tujunga); 2 km NE of Big Tujunga Dam; 745 m; 18 m; E.

(12) Fall Creek Falls (Occidental Peak); 0.5 km NE of Occidental Peak in Falls Canyon; 1525 m; n/a; NE.

(13) Fish Canyon Falls; 3.5 km W of Morris Reservoir on Fish Canyon Creek; 425 m; 35 m; SE.

(14) Fox Creek Falls; 1.5 km NE of Big Tujunga Dam; 710 m; n/a; SE.

(15) Lewis Falls; 1 km SE of Crystal Lake on Soldier Creek; 1325 m; 10 m; SE.

(16) Little Santa Anita Canyon Falls; 1 to 5 km N of Sierra Madre in Little Santa Anita Canyon; variable; variable; variable; several waterfalls that flow for a few days following a storm.

(17) Millard Falls; 1.5 km N of Altadena in Millard Canyon; 670 m; 15 m; SW.

(18) Monrovia Falls; 2 km N of Monrovia in Monrovia Canyon; 550 m; 10 m; S.

(19) San Antonio Falls; 2 km SE of Mount San Antonio. 2010 m; 40 m; SE.

(20) San Dimas Canyon Falls (East Fork); 3 km NE of San Dimas Reservoir on the East Fork of the San Dimas Creek; 610 m; n/a; W; 2 falls.

(21) San Dimas Canyon Falls (North Fork); 3 km NE of San Dimas Reservoir on the North Fork of San Dimas Creek; 550 m; 12 m; SW.

(22) Switzer Falls; 5.5 km N of Altadena in Switzer Canyon; 885 m; 15 m; W.

(23) Unnamed falls; 2 km SE of Lytle Creek Ranger Station; 850 m; less than 15 m; E.

(24) Unnamed falls (Waterman Mountain area); 0.5 km W of Kratka Ridge; 1895 m; 20 m; NE.

San Bernardino Mountains

(25) Cold Creek Falls; 1 km NE of Angelus Oaks on Cold Creek; 1730 m; 10 m; N.

(26) High Creek Falls; 2.5 km SW of San Gorgonio Mountain on High Creek; 2740 m; 7 m; S.

(27) Monkeyface Falls; 1.5 km NW of Forest Falls on Monkeyface Creek; 1490 m; 50 m; S.

(28) Mountain Home Creek Falls (East Fork); 3 km S of Angelus Oaks on the East Fork of Mountain Home Creek; 1825 m; 3 m; S.

(29) Unnamed falls; 6.5 km N of Highway 10 in a side drainage to the Whitewater River; 730 m; n/a; SW; flows only after a storm.

San Jacinto Mountains

(30) Falls Creek Falls; 5 km N of San Jacinto Peak on Falls Creek; 730 m; greater than 50 m; N.

(31) Fuller Mill Creek Falls (Lower); 3.5 km N of Pine Cove on Fuller Mill Creek; 1680 m; 10 m; SW.

(32) Fuller Mill Creek Falls (Upper); 3.5 km N of Pine Cove on Fuller Mill Creek; 1735 m; 3 m; SW.

(33) Marion Mountain Creek Falls; 4.5 km SW of San Jacinto Peak; 2170 m; 15 m; W.

(34) Oasis de los Osos Falls; 8 km N of San Jacinto Peak on Oasis de los Osos Creek; 670 m; 15 m; N.

(35) Strawberry Grotto (Lower); 2.5 km W of Idyllwild on Strawberry Creek; 1300 m; less than 5 m; W; 3 separate falls.

(36) Tahquitz Falls; 1.5 km W of Palm Springs on Tahquitz Creek; 270 m; 10 m; E.

Northern Saw-whet Owl

Sketch by Cameron Barrows

DISTRIBUTION AND DENSITY OF OWLS AT MONTE BELLO OPEN SPACE PRESERVE, SANTA CLARA COUNTY, CALIFORNIA

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From March 1986 through June 1987 I censused owls 72 km south of San Francisco in the northern end of Monte Bello Open Space Preserve, in Santa Clara County. My objectives were to identify the species and determine the density of owls in various habitats. Vocal responses to tape-recorded calls were noted and compared to weather conditions, lunar phases, and time of year.

STUDY AREA AND METHODS

The study area, approximately 300 ha, includes Stevens Creek and its headwaters and ranges in elevation from 520 to 950 m. I used aerial photographs and vegetation maps to determine the areas of the five habitat types represented there. Douglas-fir forest, composed mostly of second growth Douglas-fir (*Pseudotsuga menziesii*) with some Canyon Live Oak (*Quercus chrysolepis*) and Madrone (*Arbutus menziesii*), encompasses 75 ha. Canopy closure by these species approaches 100%. This habitat is confined mainly to the northeast-facing slopes of Stevens Creek Canyon. Broadleaf evergreen forest encompasses 75 ha mainly of Canyon Live Oak. Other members of the community include Valley Oak (*Quercus lobata*), California Bay (*Umbellularia californica*), and Madrone. A meadow, covering 125 ha, is composed of non-native European annual grasses with a few scattered patches of native perennial bunchgrasses and native annuals. On more rocky areas Coyote Brush (*Baccharis pilularis*) grows in scattered clumps. Chaparral, composed of Chamise (*Adenostoma fasiculatum*) and manzanita (*Arctostaphylos* spp.), covers approximately 22 ha on south- and west-facing slopes. A thin strip along Stevens Creek and its main feeder streams is a riparian woodland of Big-leaf Maple (*Acer macrophyllum*), Tan-oak (*Lithocarpus densiflora*), California Bay, and some willow (*Salix* sp.). This habitat is bounded on both sides by the Douglas-fir community.

I used taped recordings of owl calls to elicit responses while I walked the census route. Tapes were played at stations at 100-m intervals. Calls of each species of owl were played for 15 seconds, followed by a minute of silence. Calling owls were then mapped. Often owls would not respond to the tapes immediately so I usually stayed at each station for 5 to 10 minutes.

I censused the area 2 or 3 times a month for a total of 38 censuses, spending a total of 69 hours in the field for an average 4.6 hours per month. The census route, limited to developed and some undeveloped trails, allowed coverage of 95% of the study area. Most of the censuses were conducted during calm, clear nights, but three were conducted during strong wind or rain for information on the relationship between owl calling and weather conditions. Censuses were generally conducted between 1 hour after sunset

and 1 hour before sunrise. In May and June 1987 I put in two all-night vigils to listen to unsolicited calling and to record on tape the owls' vocalizations.

RESULTS

Six species of owls were found in the study area: the Barn Owl (*Tyto alba*), Western Screech-Owl (*Otus kennicottii*), Northern Saw-whet Owl (*Aegolius acadicus*), Great Horned Owl (*Bubo virginianus*), Northern Pygmy Owl (*Glaucidium gnoma*), and Long-eared Owl (*Asio otus*). Owls were most vocal from late December through March. Calling of all owl species except the Pygmy decreased through the late spring and summer. The period from late September through mid-November was generally quiet. The phases of the moon seemed to have little effect on calling (Table 1). Weather conditions, however, did have an effect. Although only three censuses (less than 10% of the total) were during poor weather, calling was sharply reduced during these periods.

Western Screech-Owl

The most abundant owl encountered in the study area with a density of 0.4 pairs/ha. Calling males were often encountered approximately 100 m apart in preferred habitat. Western Screech-Owls showed a preference for the Canyon Live Oaks and were rarely encountered outside this habitat (Table 2).

These owls readily responded to taped calls and were most vocal in late December and January. I usually heard screech owls while playing tapes; I rarely heard unsolicited calling. Often several minutes passed before an owl would respond to my calls. The first owl's response, in turn, would start other screech owls calling until several would be calling all around me. Western Screech-Owls responded to taped calls with the typical "bouncing ball" call (Tyler 1978). Mated pairs often responded and began to duet near each other. The initial calls switched to trilling as pairs approached one another. Other calls noted were loud barking by the adults accompanied by juveniles and puppy-like barking uttered primarily by fledged juveniles in June and July. Calling by the adults fell off markedly by the end of March (Figure 1).

Table 1 Effect of Lunar Phases on Numbers of Owls Heard

Lunar phase	Number of censuses	Number of owls heard	Average number heard per census
New	14	103	7.3
First quarter	7	43	6.1
Full	9	64	7.1
Third quarter	8	64	8.0

Northern Saw-whet Owl

Confined to the Douglas-fir forest and the associated riparian areas along Stevens Creek (Table 2), the Saw-whet is the second most common owl in the study area with density of 0.25 pairs/ha. Saw-whet Owls are very aggressive during the courtship and nesting season. They would respond to my taped calls instantly, and I often had to duck to avoid an attacking owl. Saw-whets, like Western Screech-Owls, tended to respond only to the taped calls, not to call unsolicited. Most vocal November through February (Figure 1), these owls responded to the taped calls with two types of calls. One call consisted of a single note repeated 120 to 180 times per minute. The pitch and volume increased as the owls became agitated. The other call was a nasal whine, increasing in pitch at the end, which lasted 1.5 to 2.0 seconds. Other calls included a loud angry chatter and various loud barks and whistles. To solicit food from adults juvenile Saw-whet Owls emit a call that resembles a soft hiss (Jon Winter pers. comm.). I observed a juvenile Saw-whet Owl along Stevens Creek in mid-August 1986.

Great Horned Owl

This owl ranged over all habitats in the study area (Table 2). Two pairs were present throughout the study. The one nest observed, a bulky platform of sticks, was in a large Douglas-fir 30-40 m from the ground and 3 m out from the trunk. A single owlet fledged in mid-June 1986 and continued to beg for food from the adults into June of 1987. Great Horned Owls in my study area responded to any owl call played but were located mostly by unsolicited calling. Other owl species (Western Screech-Owls in particular) became quiet around a calling Great Horned Owl.

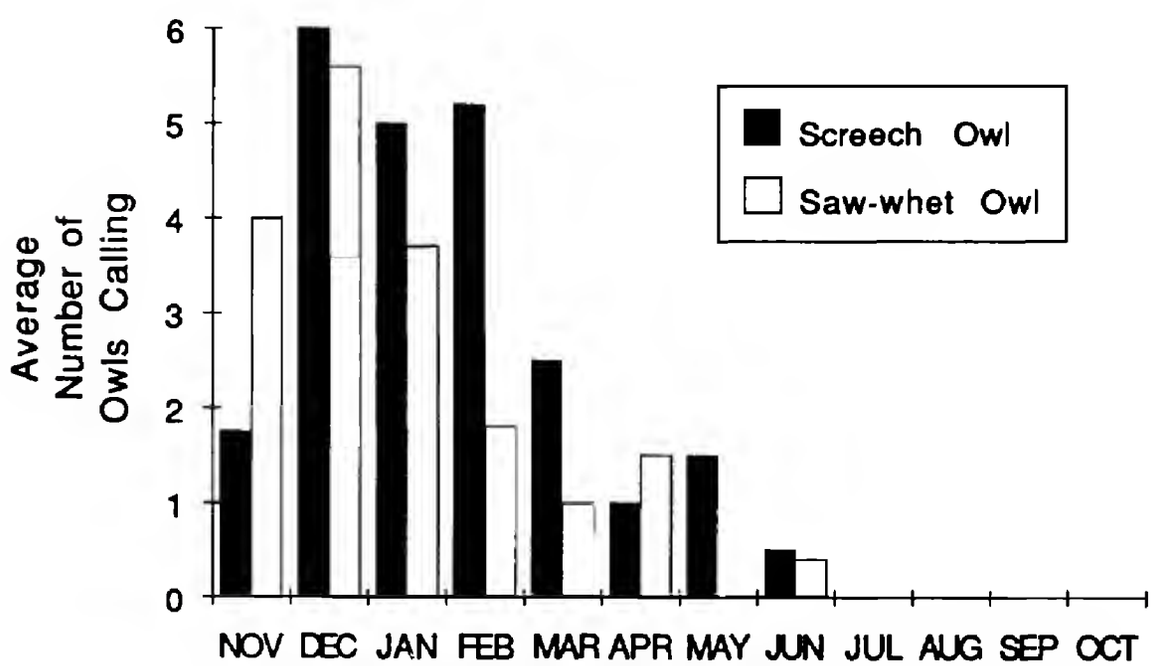

Figure 1. Average number of Western Screech-Owl and Saw-whet Owls calling per census each month.

Table 2 Distribution of Owl Occurrences by Species and Habitat

Habitat type	Percentage of study area	Percentage of Occurrences: W. Screech Owl	N. Saw-whet Owl	N. Pygmy Owl	Great Horned Owl
Broadleaf evergreen forest	25	98	4	5	31
Douglas-fir forest	25	2	80	65	39
Meadow	42	0	0	0	25
Chaparral	6	0	0	0	5
Riparian	1	0	16	30	0
Chi-square value		276.4	363.6	428.1	16.32
Significance level		$p < 0.005$	$p < 0.005$	$p < 0.005$	$p < 0.25$
Total observations		94	46	20	75

Northern Pygmy Owl

Northern Pygmy-Owls were restricted to the Douglas-firs and oaks bordering Stevens Creek (Table 2). Three pairs were encountered along the entire 4.8 km of the creek in the study area. The birds called in the two hours after twilight in the morning and the last hour of twilight in the evening (Figure 2). I never heard a Pygmy Owl call at night. The Pygmy Owls were generally located by unsolicited calling and were equally vocal throughout the year. I did not locate any nesting Pygmy Owls, but W. Bousman (pers. comm.) saw two juveniles in the study area in late July 1981.

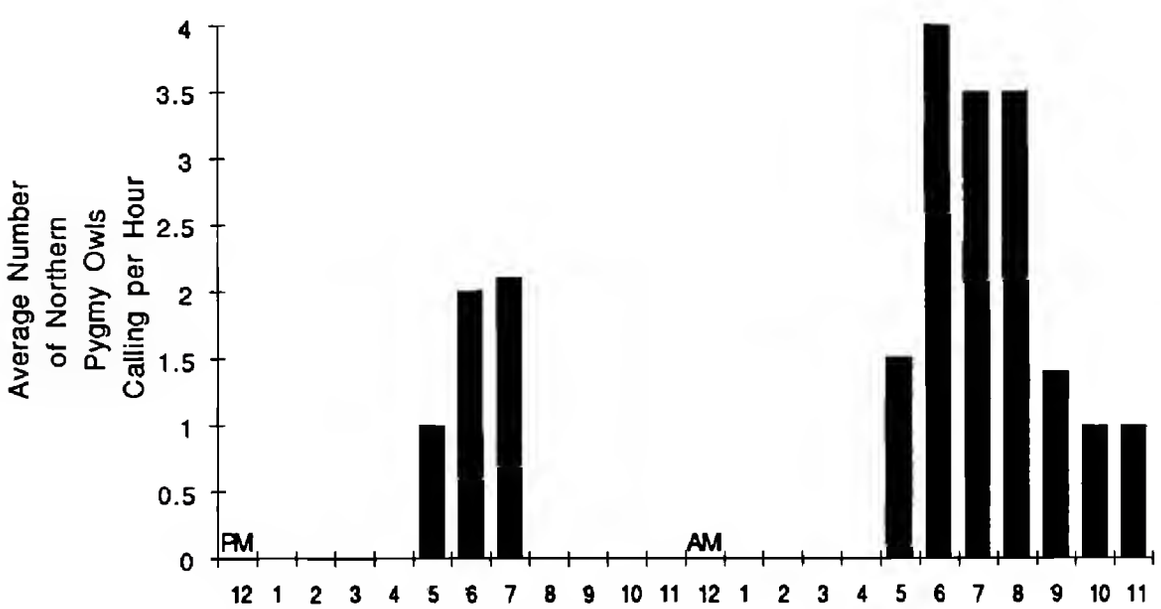

Figure 2. Calling frequency of Northern Pygmy Owls.

Barn Owl

Encountered only eight times during the study, this species was seen flying low over the grasslands or trees. I saw single birds in March, June, September, and November 1986 and in January, February, April, and June 1987. I found a possible nest site in a large dead Canyon Live Oak where I usually saw the owl, but I never saw any evidence of breeding.

Long-eared Owl

I first encountered this owl on 20 November 1986, hunting over a meadow. In late December I again saw this species calling from a willow copse. In February 1987 I witnessed a pair copulating at a potential nest site. On 14 May 1987 I saw three recently fledged young being fed by an adult close to the nest tree. The nest was placed in a Canyon Live Oak approximately 20 m from the ground and 5 m out from the trunk. It appeared to be an old flattened squirrel nest. Several pellets found below the nest contained the remains of California Voles (*Microtus californicus*); no other prey were identified. The male's call was a low hooting to which the female often responded with a higher-pitched call or cat-like mews. The fledglings' food-begging calls resembled a violin being lightly stroked. These calls were low in volume and did not carry far. The fledglings were attended by the adults until June 1987.

DISCUSSION

Population densities for Western Screech-Owls in the southwestern U.S. have been previously reported to be 2.25 pairs/ha with territories spaced closer than 100 m (Miller and Miller 1951). These densities are over five times greater than those I found during this study.

The distribution of Saw-whet Owls in California is not well known, owing in part to the species' retiring habits. Grinnell and Miller (1944) indicated that it was nowhere considered common, and that it inhabits woodland or broken forest. It has been found breeding in habitat similar to that where I found the owl in my study area in San Mateo County at Spring Valley Lakes (now Crystal Springs Reservoir). There the owls were nesting in Douglas-fir (Santee and Granfield 1939).

Information on Northern Pygmy-Owls is sparse as well, but the distance between pairs may be as low as 1.6 km where the population is dense (Tyler 1978). This distance is approximately the same as I found during my study.

The last reported breeding of Long-eared Owls in Santa Clara County was in the 1930s (Sibley 1952). No breeding has been reported from San Mateo County, which lies along the northern boundary of the study area, for 80 years. There is a February 1893 breeding record for the study area cited by Sibley (1952). There are a handful of winter records for the Long-eared Owl in Santa Clara County, but most of these are from the San Francisco Bay margin. In the winter of 1986 several Long-eared Owls were found on local Christmas Bird Counts, far more than had been found in previous years. These owls stage periodic irruptions, and, if conditions are favorable, they may stay and breed the following year.

ACKNOWLEDGMENTS

I thank the Midpeninsula Regional Open Space District, particularly James Boland, Operations Supervisor, who allowed me access to the study area after preserve hours. Jon Winter and David Suddjian kindly read drafts of the manuscript and offered comments and ideas. Thanks to Bill Bousman, Cameron Barrows, and Peter Metropulos, who provided important information, and thanks to Lynne Aldrich, Peter Gottschling, Tom Olson, and David Suddjian, who accompanied me on some of the field censuses.

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Accepted 2 February 1990

IDENTIFICATION AND SOUTHWARD LIMITS, IN AMERICA, OF *GAVIA ADAMSII*, THE YELLOW-BILLED LOON

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Various studies in recent years have advanced our knowledge of the identification of *Gavia adamsii*, the Yellow-billed Loon or White-billed Diver, and its winter distribution in North America. Still, only breeding adults are readily distinguishable (with care) from the more widespread *G. immer*, the Common Loon or Great Northern Diver.

IDENTIFICATION

After Palmer's (1962) basic handbook, important reviews of identification of *Gavia adamsii* were published by Binford and Remsen (1974), Burn and Mather (1974), Appleby et al. (1986), and the references they cited. To these may be added Schwartz (1978), McCaskie et al. (1979), and Godfrey (1986). Various helpful characters were pointed out, but most of them are rather subtle and/or show considerable individual variation, sometimes overlapping with those of *G. immer*. Even with birds in good plumage, close study is necessary, and additional complications are introduced by wear, fading, soiling, and molts. In the field, therefore, Appleby et al. warned that, even with well and closely seen birds, "too much reliance should never be placed on one or two characters alone"; identifications of even breeding adults should "be backed up by a careful check of other characters" besides the bill.

These warnings are underlined by Godfrey's report (in Palmer 1962:25, Godfrey 1986) of hybrids. Storer (1978) rejected Godfrey's identification of one of these, believing it simply a mis-sexed *immer*. However, the sexes are alike in all specific characters (differing slightly only in size), as stated in all standard references (e.g., Palmer 1962). The bird in question, Royal Ontario Museum 76360, was reexamined at my request by J. A. Dick; it resembles *immer* more than *adamsii* in the color of the shafts of the remiges, but it is nearer *adamsii* in the white of the back and in bill shape (J. C. Barlow in litt.); see also James (1981). Ornithologists need not determine a loon's sex to identify the species or possible hybrids.

In non-breeding birds, the most useful and constant characters of *adamsii* seem to be (1) Distinctly pale shafts of the middle part of the outer primaries, sometimes nearly whitish above; the pale color extends distad well beyond the tips of the primary coverts. (In *immer* the outer primaries' shafts are pale only basally, wholly dark fuscous to dusky beyond their upper coverts, so show no contrast with the dark webs.) Most of the under side of the shaft is also very pale to whitish. (2) complete lack of dusky on the distal half or more of the bill, particularly the culmen. (3) More extensive feathering anteriorly between the mandibular rami (see Binford and Remsen 1974) and a less extensive median groove beyond these (Godfrey 1986). (4) Broader feathering behind the nostril (Godfrey 1986). The maxillary ramphotheca, below the

nostril, is bare for 10 mm or more toward the base (from the posterior end of the nostril) in *immer*, whereas in *adamsii* feathering encroaches on it in less than 10 mm.

On the mandible of *G. immer* a median groove can be seen to extend distad perceptibly (at a proper angle of illumination) to within 30 mm or less of the tip. In *adamsii* the tip has no median groove for the last 35 mm or more (but it may have a slight median projection, producing a somewhat grooved appearance beside it).

In the field only (2) is useful, and it is usually difficult to get a good, direct view of the culmen from above. Appleby et al. (1986) therefore warned that even these differences "are not always so obvious under normal viewing conditions as the detailed accounts might suggest."

In fresh, unworn winter (basic) plumage, the extensively pale sides of the thick head and neck of *adamsii* are also fairly diagnostic; they contrast with a narrower (and not quite so dark) stripe down the thick hind-neck, and often with a somewhat darker auricular area. But by spring and summer young *immer* may be badly faded, obliterating this difference between the species.

Wear can whiten the tips of the webs of the primaries, but the shafts remain dark in *immer* (Figures 1 and 2). Even the most extensively whitish-shafted *immer* do not have as extensively pale shafts as the least whitish-shafted *adamsii*. This is true of all but the upper side of the secondaries (where each species may have a dark tip for 45 mm, minimum of *immer* and approximate

Figure 1. Dorsal view of primaries of Colorado loons. Left to right: DMNH 12244, male *Gavia immer*; DMNH 23974, "male" *G. adamsii*: DMNH 7807, unsexed adult *G. immer*. Note pale shafts of *adamsii*, dark shafts of *immer*.

Photo by Gary Hall, courtesy of DMNH archives

maximum of *adamsii*); the difference is most marked on the under side of the outer primaries. In *immer* the lower side of the shaft is more or less dark (not whitish) for at least 120 mm from the tip. In *adamsii* it is whitish or very pale to within about 40 mm of the tip, at least in its major part; the inner edge of the shaft is sometimes darker, on the long primaries.

Thus not all sight and photographic records of supposed extralimital *Gaviae* are fully reliable. The species known to occur in a region, properly documented by concrete evidence—preserved specimens of some kind—will appear in all their varieties of plumages and molts, clean, faded, or soiled, normally or occasionally as variants (or perhaps hybrids). The farther from birds' proven ranges (geographic and ecologic) and seasons, the greater the need of concrete, physical evidence of correct identification. "It should be borne in mind that several of the observers consulted . . . some of whom have accumulated a lot of experience of divers in flight, do not claim to identify specifically more than 40% of those that they see" (Appleby et al. 1986:387-388).

SOUTHWARD AND SOUTHEASTWARD DISTRIBUTION

From coastal British Columbia south and east, the range and status of *G. adamsii* have been misunderstood and disputed for many years. Even in

Figure 2. Dorsal view of wing (remiges) of *Gavia immer*, showing dark shafts.

Photo by Victor Krantz, courtesy of National Museum of Natural History

British Columbia the species was considered of hypothetical occurrence to 1925 (Brooks and Swarth) and was termed "scarce" to 1947 (Munro and Cowan); it is still uncommon even in winter (Campbell et al. 1989).

There were no records for the contiguous United States until 1934, when a dead bird was found (but lost) in Washington; having no specimen, Jewett et al. (1953) placed the species on the state's hypothetical list. Gabrielson and Jewett (1940) and Grinnell and Miller (1944) had no reports from Oregon or California. Today it apparently winters rarely but regularly along the coast south to northern or perhaps central California (Monterey area). The southernmost California specimen is a bird eventually found dead at Goleta, Santa Barbara County, on 12 April 1982 (Morlan 1985). Perhaps *adamsii* does not survive well in southern climes, lacking physiological/immunological adaptations to warmer ecosystems (Remsen and Binford 1975:13-14).

A single specimen from Los Coronados Islands, northwestern Baja California Norte, 24 November 1968 (Jehl 1970) gives no support to a "well-described sight record" (Simon and Simon 1974; Wilbur 1987:32) on 30 June 1973, farther south and across the peninsula near San Felipe in the Gulf of California, where *adamsii* has never been taken, even in winter. The published photograph of a "Yellow-billed Loon" in Arizona (Witzeman and Stejskal 1984) is not convincing to me, as it does not reveal the color of the culmen.

Campbell et al. (1989), like most others, suggested that this apparent southward extension of range is a recent development. There had been early reports, but all were discredited. One from Colorado (Cooke 1897) was corrected by Bent (1915), who had "always suspected . . . erroneous identification, as Colorado is so far away from the known range or migration route of this Arctic loon." The specimen proved to be an odd, yellow-billed *immer*. Another Colorado specimen, Denver Museum of Natural History (DMNH) 7807, was later marked "*adamsii* F.C. L[incoln]" but was reported by Bailey and Niedrach (1937) as the large *G. i. immer*: "It is such a large bird that it greatly resembles the immature *adamsii* except for the shape of its culmen." (See Figures 1, 3, 4).

Bailey and Lincoln (1954) reported a third Colorado specimen (DMNH 7808) as an immature *G. adamsii*. This was repeated by Bailey and Niedrach (1965), who also listed several *G. immer*, including DMNH 23974, an immature. Of 7808 they wrote "it reposed in the museum skin collection for thirty years in the series of Common Loon skins, until we studied individual birds in the course of preparation for this report." This they cited as an example of the difficulty of identifying winter and immature birds. But this specimen, in turn, was also reidentified as *G. immer* by Binford and Remsen (1974) and Remsen and Binford (1975).

After such repeated studies of the DMNH series of *G. immer*, it hardly seemed necessary to reexamine it in my taxonomic reevaluation of the collection. But I at once noted that DMNH 23974 was not *G. immer elasson* as labeled. Rather, it proved to have all Binford and Remsen's characters of *adamsii*! (Figures 1, 3, 4, center.) This bird, sexed as a male, was taken by K. C. Morse at (or near) Sterling, Logan County, on the northern Colorado plains, 19 January 1944. The label, as was customary, lacks supplementary

Figure 3. Dorsal view of Colorado loons. Top to bottom: DMNH 12244, male *Gavia immer*; DMNH 23974, "male" *G. adamsii*; DMNH 7807, unsexed adult *G. immer*.

Photo by Gary Hall, courtesy of DMNH archives

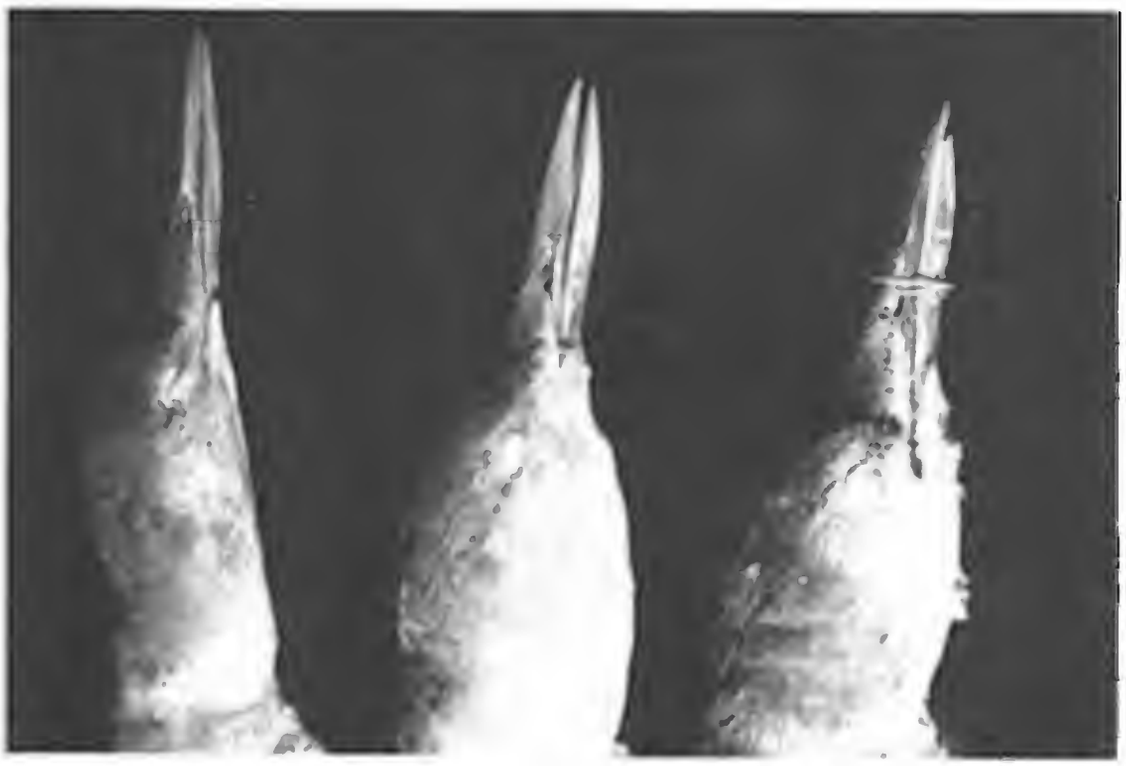

Figure 4. Heads of Colorado loons. Left to right: DMNH 12244, male *Gavia immer*; DMNH 23974, "male" *G. adamsii*; DMNH 7807, unsexed adult *G. immer*.

Photo by Gary Hall, courtesy of DMNH archives

information. The bill and foot are remarkably small (especially if the bird was sexed correctly); presumably they are still not full-grown. Morse was not a collector or regular contributor to the museum collection. Perhaps the bird was found dead or injured. But it is a normal, wild bird, establishing the occurrence of *adamsii* (at least casually) as far southeast as the Colorado plains at a date prior to its known occurrence anywhere else south of Washington (doubtfully) and British Columbia!

There is no reason to question the authenticity of the dates. DMNH 23974 was catalogued with numerous specimens taken in 1943. It was one of the earliest 1944 birds to be catalogued (though not the first). In fact, the museum's own April 1943 expedition was entered later (nos. 24065 to 24339). Thus the undated catalogue entry was probably made within a few months of the bird's receipt. The well-made specimen was doubtless prepared by the museum's taxidermists. (Such data never appeared on the labels.) And the degree of plumage wear is appropriate for January.

Not impossibly, were *adamsii* more easily distinguishable, it might prove regular in winter in Colorado. On a Denver reservoir, (soon after finding this Colorado specimen), I was shown a loon believed to be *adamsii*; the identification appeared to be correct, as far as I could tell. But at this writing DMNH 23974 remains the only specimen from Colorado or any adjacent or more eastern state, to my knowledge.

To be sure, the A.O.U. Check-lists of 1957 and 1983 accredit *adamsii* to Long Island, New York, as an accidental. This report is based on Zimmer's (1947) identification of a mandible from a badly decomposed bird; nothing else was salvaged. But even accepting Zimmer's dubious identification, we could not tell where the bird had died, as mentioned by Nichols (1948:135).

If *adamsii* does reach the interior United States regularly, this remains to be established. Any shed remiges or long-dead remains of large loons should be salvaged for identification.

Arnold and Henderson (1973) have provided an antidote to unwarranted over-optimism in loon identification: "a suspected Yellow-billed Loon was reported seen on . . . Christmas Bird Census (Amer. Birds 25:419, 1971)" in Texas; upon collection it proved to be *G. immer* "despite the oddly shaped bill."

Should *adamsii* actually prove regular in Colorado, there will be no reason to think the 1944 specimen accidental. Rather, it must cast doubt on the present general belief that the species has enormously expanded its winter range in America in recent years. Old-time ornithologists probably wasted little time searching for "this Arctic loon" at a time when the characters distinguishing it in winter were ill-defined or unknown and there was little hint of any long migration; a big *Gavia* is not easy to collect, to skin, or to store. More likely, what we now have is a greatly expanded number of eager observers, plus some knowledge of what to look for and where.

SUMMARY

Despite recent advances, the field identification of the larger loons remains extremely difficult, except in breeding plumage; even then, birds should be carefully observed. Fresh-plumaged winter birds of *usual* coloration and

shape may be identified with approximate certainty under favorable circumstances, but even museum specimens have required repeated examination for correct identification. Records outside the normal, proven range (geographically or seasonally) require specimen evidence, since the most reliable differences are not visible in the field and hybrids have been reported.

Discovery of a specimen from Colorado taken (doubtless at random) in 1944 not only extends the established range of *Gavia adamsii* onto the Great Plains but also suggests that the species' apparent enormous range expansion is an artifact of more intensive searching. But additional concrete evidence of normal wintering so far southeast is still needed.

This discovery also re-demonstrates the lasting importance of properly maintained scientific collections for accurate understanding of birds and their distributions, and the desirability of fuller labeling than has been customary.

ACKNOWLEDGMENTS

For help with references, examining specimens, etc., I am indebted to Jon C. Barlow, M. Ralph Browning, R. Wayne Campbell, James A. Dick, Kimball L. Garrett, Daniel D. Gibson, Mark Holmgren, Guy McCaskie, Robert Phillips, and Amadeo M. Rea. Photographs were taken by Gary Hall, courtesy of DMNH Archives, and by Victor Krantz, courtesy of U. S. National Museum of Natural History.

Specimens were examined at the Denver and National Museums. I extend my thanks to their authorities and to all the above colleagues. The manuscript was improved by comments of J. Van Remsen and Philip Unitt. I thank Betty Grillos for typing the final copy.

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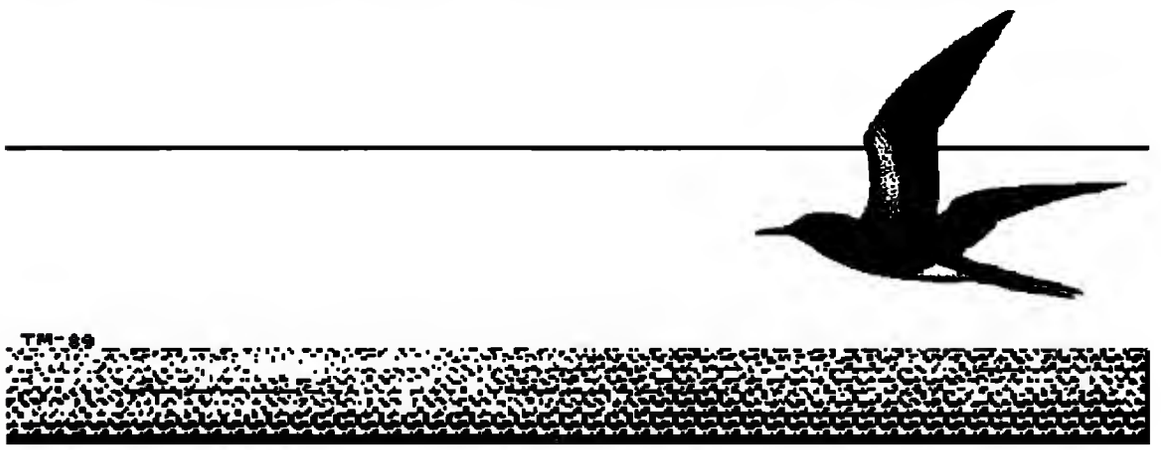
Accepted 9 June 1990

The following article is the sixth in a series on California rarities edited by Morlan and Roberson. It is based on materials submitted to the California Bird Records Committee (CBRC). The description and circumstances were drawn from the account of the observer and have been reviewed by him. Roberson prepared the distributional summary; Morlan prepared the identification summary. In this way we hope much important information accumulated in CBRC files will become widely available.



Sooty Tern *Sketch by Tim Manolis*

FIRST RECORD OF THE SOOTY TERN IN CALIFORNIA

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JOSEPH MORLAN, 417 Talbot Ave., Albany, California 94706
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At about 1500 on Monday, 27 September 1982, Webster was birding at the San Diego River mouth, San Diego County, California. He was standing on the south side of the flood control channel, viewing the flats through a 15-25× spotting scope, when he noted an unusual tern about 50 yards away. It flew with steady, rowing wingbeats, rising and falling a bit on every stroke, as it headed into the stiff breeze coming off the ocean. After a rainy morning, the sun was out, though winds were still gusting to 20 miles per hour. The lighting was excellent as the bird passed, flying west, but became less so as the tern continued down the channel and out over the ocean. Webster recognized it as an immature-plumaged Sooty Tern *Sterna fuscata*. He wrote the following description (slightly edited to produce full sentences):

The bird was a medium-sized tern, appearing larger than a Forster's Tern *S. forsteri* and a little bit smaller than an Elegant Tern *S. elegans*, although there were no other terns in same field of view (though five other species of terns were seen immediately before and after the sighting). The wings were slim and sharply angled but did not appear especially long. The overall color was a dark blackish brown, apparently more brown than blackish, although it seemed to be close to an even mix. The color appeared to be uniform, with the exception of a most noticeable white area on the vent and undertail covert region. The white was clear, and while not sharply demarcated from the rest of the underparts, merged rapidly into the dark of the belly and

breast, giving the bird a pattern not unlike that of a breeding-plumaged Black Tern *Chlidonias niger*. The flight feathers were dark and contrasted with some pale whitish on the underwing coverts. There was no such contrast on the upper surface of the wing. The upperparts appeared darker than the dusky portions of the underparts. There was faint buff spotting on the upperwing coverts and on the back; I looked for this character in the field and it was not very prominent (e.g., young Heermann's Gulls *Larus heermanni* show much more conspicuous spotting on this date). The tail was fairly long and gave the impression of being deeply notched. The bill was long, slender, and dark.

I have no prior experience with this plumage of Sooty Tern and have only seen a few adults of this species before. I had a mental image of the field guide pictures and was expecting a dark bird with upperpart edgings. I was surprised by the white undertail covert area.

The record was unanimously accepted by the California Bird Records Committee (CBRC) after two circulations (Morlan 1985). It constitutes the first record for California.

When the CBRC evaluated this record, the available literature on the Sooty Tern's plumage sequences was deficient or misleading, prompting concern among Committee members over the plumage as described. One source (Harrison 1983) incorrectly pictured juvenal birds with white outer tail feathers, though showing the white crissum and underwing coverts described. Other sources (e.g., Alexander 1928, Ridgway 1919) failed to describe the whitish underwing coverts and the extent of white undertail coverts, though Witherby et al. (1944) did. Available photos (e.g., Farrand 1983) of juvenal birds showed white spots or barring on the back much more extensive than Webster described. However, wear reduces the spotting significantly (Oberholser 1974), and in the end the CBRC members considered Webster's description acceptable. Since the review, photos that show the extent of white on the underparts and underwings well have been published (e.g., Harrison 1987), confirming the analysis of the Committee. A previously unpublished photo of this plumage appears as Figure 1; this bird also lacked any spotting or barring on the upperparts (Roberson pers. obs.).

Beyond the identification itself, the Committee discussed the propriety of accepting a first state record based on a rather brief sighting by a single observer. Perhaps it is this point that prompted Phillips (1986) and Unitt (1984) to doubt the record. However, the Committee considered this issue along with all other facts and, on this rare occasion, accepted such a record (see Trochet et al. 1988 for another example and fuller discussion of this topic).

One relevant factor was the recent passage of tropical depression Olivia, which had passed over the Sooty Tern's pelagic range as a hurricane on its way north. During mid-September 1982, Hurricane Olivia developed in the tropical eastern Pacific Ocean and began moving north off the western coast of Mexico. By Tuesday, 21 September 1982, it was churning due south of Baja California, with sustained winds of 140 miles per hour. By mid-day on Wednesday, it was heading northwest but losing intensity. On Thursday it was downgraded to a tropical depression, whirling 700 miles south of Los Angeles. By mid-day on Saturday, 25 September, Olivia was about 240 miles southwest of southern California and heading towards the coast. It was largely dissipated as it moved over land on Sunday, 26 September, bringing

showers and gusty winds (all per satellite photos and weather notes in the *Los Angeles Times*; see Figure 2). Webster and most Committee members attributed the bird's presence to the storm.

DISTRIBUTIONAL SUMMARY

The Sooty Tern has a wide distribution in the tropics, nesting on islands in all tropical oceans. Its nesting cycle encompasses the entire year, with different colonies nesting in different seasons according to latitude and local conditions (Murphy 1936). In the eastern Pacific, the Sooty Tern nests in Hawaii and on islands off western Mexico, including Clipperton, the Tres Marias, and the Revillagigedos (A.O.U. 1983; see Figure 2). Recently a colony of about 250 birds was found nesting on the Alijos Rocks, some 160 miles west of southwestern Baja California (24°57′ N, 115°45′ W) and approximately 500 miles due south of San Diego (Pitman 1985).

The Sooty Tern generally avoids inshore waters except to visit its breeding islands (Diamond 1978, Au and Pitman 1986). Most vagrants onshore have been found after the passage of tropical storms. Hurricane Olivia passed over or near the Alijos Rocks, crossing the northeastern pelagic range of the Sooty Tern in the eastern Pacific (Gould 1974, Pitman 1986; see Figure 2).

Away from the breeding islands, Sooty Terns are extremely pelagic (Ashmole and Ashmole 1967, Diamond 1978). They forage by following schools of skipjack *Katsuwonus pelamis* and other species of tuna, being near-obligate commensals (Au and Pitman 1986). As they cannot rest long

Figure 1. Subadult Sooty Tern in the eastern tropical Pacific (6°12′N, 113°30′W), 11 August 1989. Note white crissum and underwings.

Photo by Don Roberson

on the water (Gould 1974), their adaptations include a continuous agile flight, constant vocalizations, and the ability to recognize distant foraging flocks and detect surfacing fish (Au and Pitman 1986). These foraging flocks include a substantial percentage of subadult birds in the late summer and fall (Roberson pers. obs.; see Figure 1).

In the northwestern Pacific, typhoons regularly carry Sooty Terns beyond their normal range. Gould (1974) listed 28 instances from 1966 to 1968 of banded birds being driven out of their normal range by typhoons, including a bird banded on 11 May 1965 on Johnston Island (south of the Hawaiian Islands) that was dropped by typhoon Trix over eastern Honshu, Japan, on 18 September 1965. This bird was at a latitude of 37° 40′ N and some 3000 miles from its natal island.

In eastern North America the Sooty Tern nests on islands in the Gulf of Mexico from Texas to Lousiana, on the Dry Tortugas and other inlets off southern Florida, and has nested as far north as South Carolina (Wilkinson 1987, 1988) and North Carolina (Fussell et al. 1981). It follows the Gulf Stream north regularly to at least North Carolina (Lee and Booth 1979), and storms push it farther. Records, often associated with hurricanes, exist for every northeastern state (DeSante and Pyle 1986). Northernmost examples include three on Hog Island, Maine, after a hurricane in September 1954, and five scattered over that state after a hurricane in September 1960

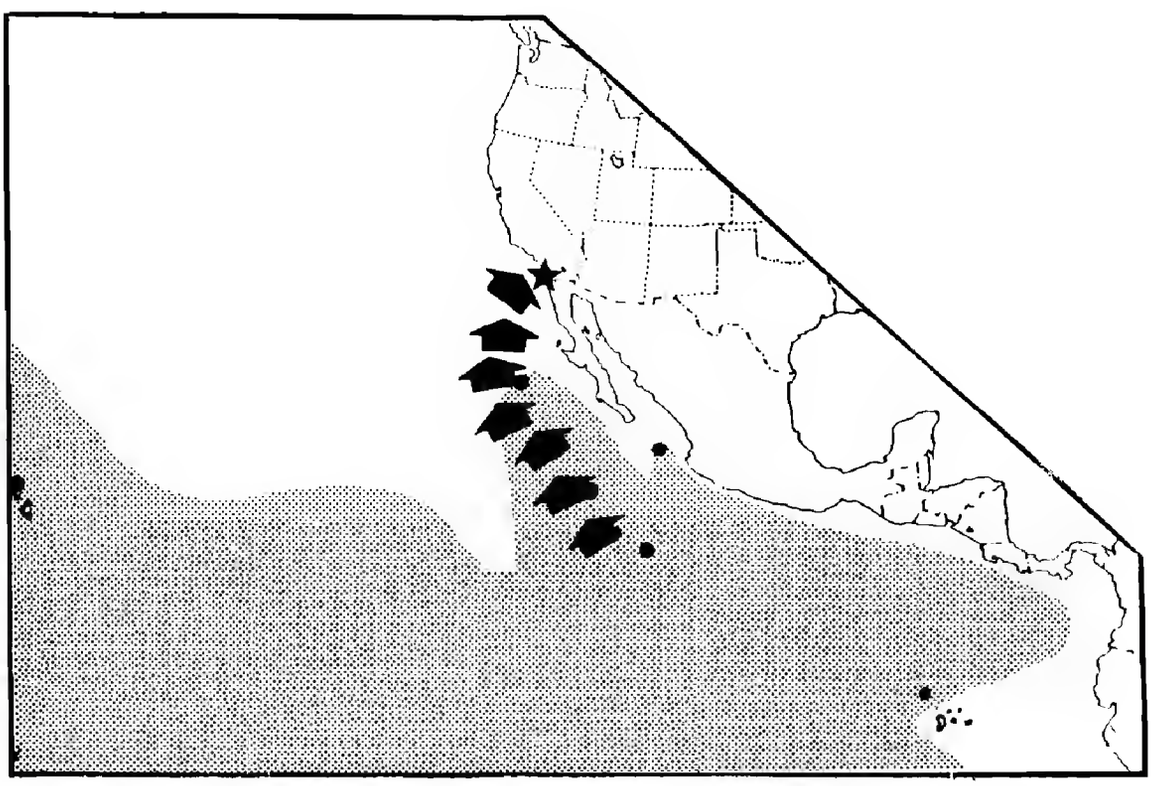

Figure 2. Breeding range of the Sooty Tern in the eastern Pacific (dots indicate colonies), approximate pelagic range (shaded; after Pitman 1986), and location of California sighting (star). Approximate 1300 positions (south to north) of Hurricane Olivia from 20 to 26 September 1982 are shown by arrows, indicating path of movement (based on satellite photos published in the *Los Angeles Times*).

(Vickery 1978). One was picked up dead on 28 August 1924 at Wolfville, Nova Scotia, after the passage of a hurricane, and a sight record of one at Three Fathom Harbor, Nova Scotia, on 21 October 1968, was attributed to Hurricane Gladys (Godfrey 1986). Inland records exist for Texas (after Huricane Allen in August 1980, Arnold 1984), Arkansas, Wisconsin, Tennessee, West Virginia, Vermont, and Ontario (DeSante and Pyle 1986).

SUBSPECIES

Cramp (1985) pointed out that geographic variation in this species is slight and that the validity of some of the six currently recognized subspecies is questionable. According to Blake (1977), *S. f. crissalis* of the Pacific coast of Central America and Mexico differs from the nominate *fuscata* of the Atlantic and Caribbean by the "more decidedly grayish" underparts of the adult. We presume the San Diego bird to have been *crissalis* or, possibly, the central Pacific *oahuensis*.

IDENTIFICATION SUMMARY

The Sooty Tern normally takes 1 to 2 years to acquire adult plumage. Juvenal birds are all dark with buff or golden barring or spotting on the mantle. These markings are lost with the acquisition of the first basic plumage, which is dark with whitish patches on the underwings and white undertail coverts (Figure 1). Some birds have extensively white bellies (Roberson pers. obs.). The exact sequence to adult plumage is not well known. However, 30% of 3-year-old birds and 5% of 5-year-old birds retain some dark speckling below (Urban et al. 1986).

The Sooty Tern in juvenal or subadult plumage might be confused with the Black Tern *Chlidonias niger*. The Black Tern is much smaller than the Sooty Tern, and it flies very differently, more like a butterfly or nighthawk *Chordeiles*, depending on the wind (Connor 1988). The flight of the Sooty Tern is strong and purposeful, but buoyant. Flint and Nagy (1984) found that high winds had little effect on characteristics of this species' flight. At least one previous report of the Sooty Tern from California (Moss Landing) was based on a misidentified Black Tern in winter plumage. Another claimed Sooty Tern photographed in Mississippi (Jackson et al. 1978) was likewise a Black Tern in winter plumage (Clapp et at. 1983). A heavily oiled tern resembling the immature Sooty Tern is also a possibility. However, oiled terns should not have the distinct spotting and barring on the upperparts shown by juvenal Sooty Terns, nor the distinct white crissum of older birds.

The immature Sooty Tern is very different from the immatures of the other tropical terns of similar size. The immatures of both the Bridled *Sterna anaethetus* and Gray-backed *Sterna lunata* terns have white underparts. Young Sooty Terns are more likely to be confused with noddy terns *Anous*, the young of which lack the distinctive white caps of the adults (Pratt et al. 1987). The longer wedge-shaped tail of noddy terns, white crissum and underwings of the subadult Sooty Tern, and different behavior should prevent confusion. Rauzon (1985) published a photograph of a leucistic Sooty Tern from Hawaii that had white feathers mixed with black on its

crown, nape, and back. This individual probably would not be confused with any other species, but such abnormal patterns of pigmentation might cause confusion.

The adult Sooty Tern is most likely to be confused with the adult Bridled Tern. The recent discovery of breeding Bridled Terns at San Blas, Mexico (S.N.G. Howell fide P. Pyle), extends that species' known breeding range far to the north, making the Bridled Tern a possibility for storm-driven dispersal to California. Duncan and Havard (1980) and most field guides claim that the adult Bridled Tern has a complete white collar. Harris (1988), however, noted that the white extends only part way up the side of the neck and not entirely across the nape. He also noted that the position of the eye in relation to the "bridle" is not easy to see and suggested the larger white area extending higher onto the forehead of the Sooty Tern versus the thin bar of white on the forehead of the Bridled Tern as a field mark. The black lore stripe also meets the bill higher on the Bridled, further squeezing the white into a thin strip (see Figure 3). This gives the Sooty Tern a "happy" or "relaxed" expression in contrast to the "frowning squint" of the Bridled (Connor 1988).

The solid black back of the Sooty Tern does not contrast with its black cap as does the gray-brown mantle of the Bridled Tern. However, in bright sunlight, Sooty Terns may look washed out, thus resembling Bridled Terns. Under these conditions, Harris (1988) found the pattern of the underwings to be helpful. The Bridled has the outer primaries largely white from below, while on the Sooty Tern all the remiges appear dark gray below. The paler undertail discussed by Lithner (1983) may be useful in the Atlantic, but the differences may not apply to Pacific populations (Harris 1988).

In the central Pacific, the Gray-backed Tern may be confused with Bridled or Sooty terns. It resembles a small Bridled Tern with a much more delicate flight, recalling that of the Arctic Tern *S. paradisaea*.

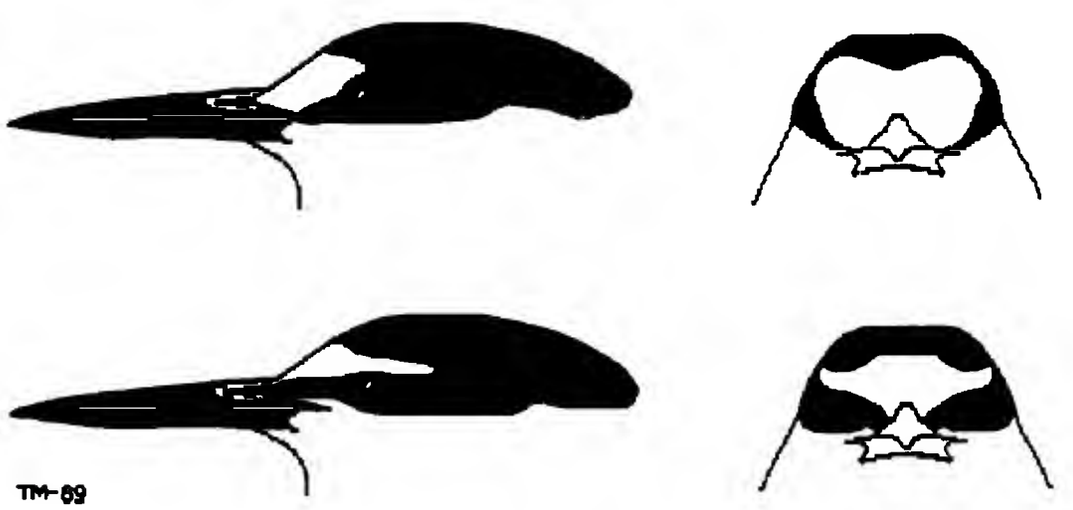

Figure 3. Head patterns of adult Sooty and Bridled terns (after Harris 1988).

ACKNOWLEDGMENTS

We thank Laurence C. Binford, Jon L. Dunn, Kimball L. Garrett, H. Lee Jones, Paul E. Lehman, Guy McCaskie, and Benjamin D. Parmeter for their helpful comments in reviewing this record. Keith Hansen and Peter Pyle supplied unpublished information. Robert L. Pyle reviewed an earlier draft and made many useful suggestions. Tim Manolis kindly drew the sketches. Roberson's surveys in the eastern tropical Pacific were supported by the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration. Data from these surveys were kindly made available by Stephen B. Reilly and Robert L. Pitman of the Southwest Fisheries Center, NMFS, NOAA.

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Accepted 9 March 1990

NOTES

FIRST REPORT OF NESTING LESSER GOLDFINCH IN IDAHO

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The A.O.U. Checklist (1983) listed the Lesser Goldfinch (*Carduelis psaltria*) as casual or accidental in southwestern British Columbia, eastern Oregon, and southern Wyoming. It was not listed for Idaho by Burleigh (1972) and was reported without details as a rare spring migrant at the Minidoka National Wildlife Refuge, southern Idaho, by Larrison et al. (1967). Before 1988 there were only eight Lesser Goldfinch records for Idaho, all from southern counties (Bannock, Canyon, Elmore, Minidoka, and Twin Falls). For a review of seven of these records see Taylor and Trost (1987). An additional record not reported by Taylor and Trost is of one observed by Jeff Marks on Simco Road 0.2 mi. north of Highway 67, in Elmore County on 18 September 1982 (pers. comm.).

On 5 July 1988, Webb discovered a green-backed male Lesser Goldfinch feeding five juveniles 2.1 miles south of Pocatello along the west side of Mink Creek Road, across from Frazier's Egg Farm. Later the same day Trost observed the juveniles and confirmed that they were Lesser Goldfinches (greenish plumage above, dark bill, and yellow undertail coverts). On 12 July, Stephens observed a female Lesser Goldfinch feeding three juveniles in a half-dead Black Hawthorn (*Cragaegus douglasii*) at the same location. The juvenal plumage on these birds was not completely developed, and they could barely fly from branch to branch. An adult male was within 5 to 10 meters and another adult male was seen about 50 meters to the south.

Mink Creek runs year round and lies less than 100 meters to the east of the road where these birds were seen. The site was at the bottom of an east-facing slope on relatively level ground. The dominant vegetation in the immediate vicinity included Big Sagebrush (*Artemisia tridentata*), Black Hawthorn, Common Chokecherry (*Prunus virginiana*), currant (*Ribes* sp.), Utah Juniper (*Juniperus osteosperma*), and willow (*Salix* sp.). Water Birch (*Betula occidentalis*) is common along Mink Creek.

Additional observations of male and female Lesser Goldfinches were made in the Pocatello area from 17 June (one in Webb's yard) through July of 1988. These include sightings in town and at Cherry Springs Nature Area (3 miles south of Pocatello on Mink Creek Road) by us and several other observers. At least one singing male was heard and seen on the west side of Pocatello during June and July of 1989, and a pair was observed at the Mink Creek nesting site on 17 July 1989, but juveniles were not seen.

During the summer, Lesser Goldfinches depend physiologically on a substantial water supply for drinking and bathing (Ryser 1985). The availability of water is believed to affect the occurrence of this species strongly (Linsdale 1957). It therefore seems possible that Lesser Goldfinches were attracted to Mink Creek because of the drying up of more traditional nesting areas to the south during the drought of 1988.

However, increases in Lesser Goldfinch numbers observed in northern Utah during the summer of 1988 (Kingery 1988) suggest that the influx to southeastern Idaho was due to a general increase (for whatever reason) throughout the northern Great Basin region in 1988.

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Accepted 2 February 1990

COWBIRD PARASITISM ON THE LEAD-COLORED BUSHTIT

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The Bushtit (*Psaltriparus minimus*) is evidently not a common host of the Brown-headed Cowbird (*Molothrus ater*). Only eight instances of cowbird parasitism on this species have been reported (Bent 1946, Friedmann 1963, Friedmann 1966, Friedmann et al. 1977, Smith and Atkins 1979, Friedmann and Kiff 1985). One involved the subspecies *P. m. californicus*, the other seven, *P. m. minimus*. Here we report the first known instance of cowbird parasitism on the subspecies *P. m. plumbeus*, the Lead-colored Bushtit, and an observation of adult Lead-colored Bushtits feeding a fledgling Brown-headed Cowbird.

On 26 May 1988, while censusing pinyon-juniper woodland in the Pine Nut Mountains, Carson City, Nevada (39°06'N, 119°37'W), for a study on breeding bird densities, we discovered a Bushtit nest in a Single-leaf Pinyon (*Pinus monophylla*) by following two Bushtits that were carrying food. The nest was 4.7 meters from the ground and well hidden in the needles of the tree. We watched for several minutes as the birds entered the nest with food and exited without. We did not check the nest for contents. Although we passed the nest on six additional censuses between then and 14 June, we saw no more activity at the nest, and do not know if the young fledged. On 24 June we returned to the area to make measurements of nest-site characteristics. We collected the nest and found it contained six recently laid Bushtit eggs and one cowbird egg. The eggs were cold, and no adults were seen in the area during the 40 minutes we were there, suggesting that the nest had been abandoned. The nest showed no signs of damage, as had been reported in two prior instances of cowbird parasitism on this species (Friedmann 1977, Smith and Atkins 1979). The nest is now specimen number 68 in the nest collection of the University of Nevada Museum of Vertebrate Biology.

The second incident also occurred in the Pine Nut Mountains of Nevada, about 4.8 km south of the nest site described above. On 9 June 1988, during a morning census of pinyon-juniper woodland, we were attracted by the calls of Bushtits near the top of a pinyon, about 4.2 m from the ground. Adult Bushtits were carrying food to a nest in the tree, but instead of entering the nest, they fed the food to a fledgling Brown-headed Cowbird perched beside the nest. Whenever a Bushtit approached with food, the cowbird vibrated its wings rapidly, gaped, and uttered loud begging calls. At least three Bushtits brought food to the fledgling, indicating a possible helper at the nest. We caught and banded the cowbird; its flight feathers were about half grown, with sheaths still present. We placed the cowbird back near the Bushtit nest, but after a few minutes it flew to a nearby pinyon and we were unable to locate it again. The nest contained six nestling bushtits, all close to fledging. We banded the nestlings and returned them to the nest. During this time the three adults continually circled the nest tree uttering alarm calls while carrying food in their beaks.

We visited the nest site 4 days later. The nest was empty and we assumed the young had fledged. This was confirmed on 16 June when we saw the banded young foraging in a flock with unbanded adults 300 meters northeast of the nest site.

We do not know if the Bushtits were the actual foster parents of this cowbird. Observations of adults feeding fledgling cowbirds are not conclusive evidence that those adults are the foster parents; Klein and Rosenberg (1986) and Scott (1988) have reported several examples of cowbird fledglings being fed by more than one species.

Thus, this particular individual could have been raised by some other host but attracted the Bushtits by its loud and persistent begging calls. However, to our knowledge, this is the first known instance of Bushtits feeding a fledgling cowbird.

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Accepted 26 December 1989

FIRST CONFIRMED NESTING OF THE BLACK-SHOULDERED KITE IN WASHINGTON

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The range of the Black-shouldered Kite (*Elanus caeruleus*) in the United States has been described as restricted to southern Texas, California (west of the desert and the Sierra Nevada), Florida, Louisiana, and Oklahoma (rare) (American Ornithologists' Union 1957). The species has been expanding its range during the last 30 years, however (Eisenmann 1971, Larson 1980), and has now been reported in at least 22 states (American Ornithologists' Union 1983, Clark and Wheeler 1987, Toups et al. 1985).

On the Pacific coast, records of the Black-shouldered Kite breeding in California extend into the last century (Taylor 1887). In Oregon, the earliest kite observation was reported by Jewett (1933) near Portland. Henny and Annear (1978) located the first breeding pair near Corvallis in 1977.

Kites were first recorded in Washington on 10 July 1975 at the Nisqually River delta, Thurston County, and on 27 November 1977 near Raymond, Pacific County (Harrington-Tweit 1980). The species has since been reported at Raymond annually (Terry Wahl pers. comm.). Elsewhere in southwestern Washington, kites have been seen regularly at Toledo, Lewis County, Grays Harbor, Grays Harbor County, and on the Long Beach Peninsula, Pacific County (Phil Mattocks pers. comm.). The northernmost record for the state is for 29 October 1983 near Samish Island, Skagit County (Thais Bock pers. comm.) Although this location lies only 30 miles south of the Canadian border, the species has yet to be reported in British Columbia (R.W. Campbell pers. comm.).

Although there have been observations of at least four separate family groups in the southwestern part of the state during the last decade, we here report Washington's first confirmed nesting record for the Black-shouldered Kite.

On 12 May 1988, Batchelder watched a pair of kites copulate atop a Sitka Spruce (*Picea sitchensis*) near the Raymond airport. On a later visit (26 May), he saw an adult kite capture prey and carry it to the same tree. A month later (28 June), a transfer of prey between two adults was observed. The bird receiving the prey then flew into the nest site. The following day, we used a Questar telescope (54×) to confirm the presence of at least one live downy young in the nest. We estimated it to be approximately 10-14 days old.

We revisited the site on 23 July and approached the nest tree for the first time. We found three dead chicks, half-grown (Burke Memorial Washington State Museum specimen no. 43032). We could not determine the cause of death, although we suspect it was related to an unseasonably cold, wet period in late June.

The nest was 20 inches in diameter and 5 inches thick. It was composed of sticks from both deciduous and coniferous trees and had a mat of mammal fur 1 inch thick on its floor. It was situated against the north side of the main trunk, 54 feet above ground and 4 feet below the top of the tree. The nest was well concealed and very difficult to see from the ground.

The nest tree was located in a row of spruce, red alder (*Alnus rubra*), and willow (*Salix spp.*) bordering the eastern boundary of the airstrip. The surrounding area, located at sea level, is open, flat pasture land reclaimed historically from the adjacent mudflats of Willapa Bay. Vegetation consists of grasses, Canada Thistle (*Cirsium arvense*), Common Horsetail (*Equisetum arvense*), Tansy (*Tanacetum vulgare*), and tussocks of *Juncus*.

During the last six years, at least four other family groups, all of late-season flying birds, have been observed in southwestern Washington, but no nests have been reported. In 1982, R. Widrig (Harrington-Tweit et al. 1982) found two adults and two juveniles flying together at Leadbetter Point, Pacific County, on 18 and 23 September. On 5 September 1984, L. D'Veck (pers. comm.) saw two adults feeding a single young near Oysterville, Pacific County. In 1987, on 18 August, B. Harrington-Tweit located two adults and four immatures near the Raymond airport (Mattocks 1988), and on 7 September, L. D'Veck (pers. comm.) observed another adult feeding three young near Oysterville.

We thank Bill Clark for his comments and suggestions on this report.

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Accepted 2 February 1990

FIRST BREEDING RECORD OF THE SNOWY PLOVER FOR SAN CLEMENTE ISLAND

CLARK S. WINCHELL, Natural Resources Office, Staff Civil Engineer, Naval Air Station North Island, San Diego, California 92135

On 22 April 1989 I observed an adult and chick Snowy Plover (*Charadrius alexandrinus*) standing within 10 cm of each other at West Cove at San Clemente Island. I found the birds at 2355 hr by spotlight while surveying the intertidal zone and observed them for 2 minutes from a distance of 15 m. The adult then took flight, leaving the chick, which I subsequently captured and examined for 3 minutes. I took no measurements, but from its feather development I estimated the chick would not fledge for at least 1 or 2 weeks.

Snowy Plovers are fairly common winter visitors on San Clemente Island, as established by numerous reports (Howell 1917, Jorgensen and Ferguson 1984, Linton 1908, Page et al. 1986). However, there are no breeding records for this species at San Clemente Island. Breeding of Snowy Plovers on the California Channel Islands is documented only for Santa Rosa, San Miguel, and San Nicolas, with an estimated minimum of 130 breeding pairs (Page and Stenzel 1981).

San Clemente Island is the southernmost of the California Channel Islands, lying 103 km west-northwest of San Diego. Jorgensen and Ferguson (1984), Olmstead (1958), and Raven (1963) provided excellent descriptions of the Island, its geological features, and vegetation, respectively.

Large coastal sandy beaches typical of Snowy Plover breeding sites are absent from San Clemente Island. The 88.5-km coastline of the island is mostly rocky except for five small sandy beaches, constituting 4.6 km of coastline. Three of these, at China Cove, Horse Beach Cove, and Pyramid Cove, are at the southern end of the island; the other two, at Northwest Harbor and West Cove, are at opposite sides of the northern end of the island. West Cove is the smallest of the five, measuring only 120 m along the mean high tide line. Its depth, measured from the mean high tide line to clay soil substrate, is 105 m. In general, the beach is shaped like a half circle, with little to no vegetation and no adjacent dunes. The topography above mean high tide is flat.

At San Clemente Island, not only are sandy beaches few, but some of them are used for minor military maneuvers, and Island Foxes (*Urocyon littoralis*) and Common Ravens (*Corvus corax*) frequent them. These factors combine to preclude the establishment of a large breeding population of Snowy Plovers on the island. Small groups or solitary pairs, however, may exist, having been overlooked previously because of infrequent and short sampling efforts.

I thank Jan Larson and William T. Everett for their critical reviews of the manuscript. As reviewers Gary Page and Philip Unitt supplied helpful editorial comments. In addition, I thank Commander Jonathan Duke and the U.S. Navy for supporting natural resources programs on San Clemente Island.

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Accepted 26 April 1990

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Cover photo by © B. "Moose" Peterson of Santa Barbara, California: nestling Black Swift (*Cypseloides niger*) near Idyllwild, California, August 1987.

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WESTERN BIRDS

Vol. 21, No. 2, 1990

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Quarterly Journal of Western Field Ornithologists

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Published November 15, 1990 ISSN 0045-3897

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WESTERN BIRDS

Volume 21, Number 2, 1990

IDENTIFICATION OF WHITE AND BLACK-BACKED WAGTAILS IN ALTERNATE PLUMAGE

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Since the American Ornithologists' Union (1983) considered the White Wagtail (*Motacilla alba*) and Black-backed Wagtail (*M. lugens*) separate species, interest in their field identification in North America has grown. The White Wagtail breeds across Eurasia to western Alaska, while the Black-backed Wagtail breeds primarily in the Kamchatka Peninsula; the two are sympatric along the Bering Sea coast north of the Kamchatka Peninsula (Morlan 1981, A.O.U. 1983). The Siberian (and Alaskan) subspecies of the White Wagtail is *M. a. ocularis*, which, together with *lugens*, differs from other forms of White Wagtail in its black eyestripe; both forms winter in southeast Asia.

The prebasic molt (July to September), partial in juveniles, is mostly completed on the breeding grounds prior to migration. The prealternate molt, which includes the central restrices and often some tertials, takes place (December to April) mostly on the winter grounds prior to northward migration. Apparently, *lugens* requires two years to attain definitive alternate plumage (Morlan 1981), but this may be variable (see below); *ocularis*, like most passerines, attains definitive plumage in one year.

Adults of *lugens* have mostly white wings, while adults of *ocularis* have mostly dark wings. However, first-year birds of both forms have mostly dark wings, and the juvenal and first basic plumages usually are indistinguishable in the field. Some confusion exists in the literature concerning distinctions between the Black-backed and White wagtails in alternate plumage, and most sources differ in their treatment of alternate-plumaged "adults," particularly females (Morlan 1981, Gibson 1983, National Geographic Society [NGS] 1983, 1987, Wild Bird Society of Japan [WBSJ] 1982). First-alternate-plumaged females of *lugens* and alternate-plumaged *ocularis* (especialy females) can be at best difficult to distinguish in the field. Typically, alternate-plumaged males of *lugens* of all ages have much black on the back

and usually are not a problem to identify. Here I discuss identification of alternate-plumaged Black-backed and White wagtails, especially the distinctions between *ocularis* and first-year *lugens*.

METHODS

I examined over 200 specimens, of both forms, at the American Museum of Natural History, New York (AMNH), the Museum of Comparative Zoology, Harvard University (MCZ), the Museum of Vertebrate Zoology, University of California, Berkeley, and the British Museum. In particular, I examined all 64 specimens of alternate-plumaged *lugens* collected between mid-April and June, and compared them with 62 alternate-plumaged *ocularis* collected from mid-April to June. Identification of specimens was based upon unequivocal plumage characters and/or locations within the known breeding ranges. Potentially misidentified birds were omitted from the analysis.

The criteria I examined were (1) chin (and upper throat) color, (2) back and rump color, (3) wing pattern, (4) tail pattern, and (5) bill size. Specimens were segregated by age on the basis of differential wear and pattern of flight feathers, and by sex on the basis of specimen labels and measurements (males average larger than females).

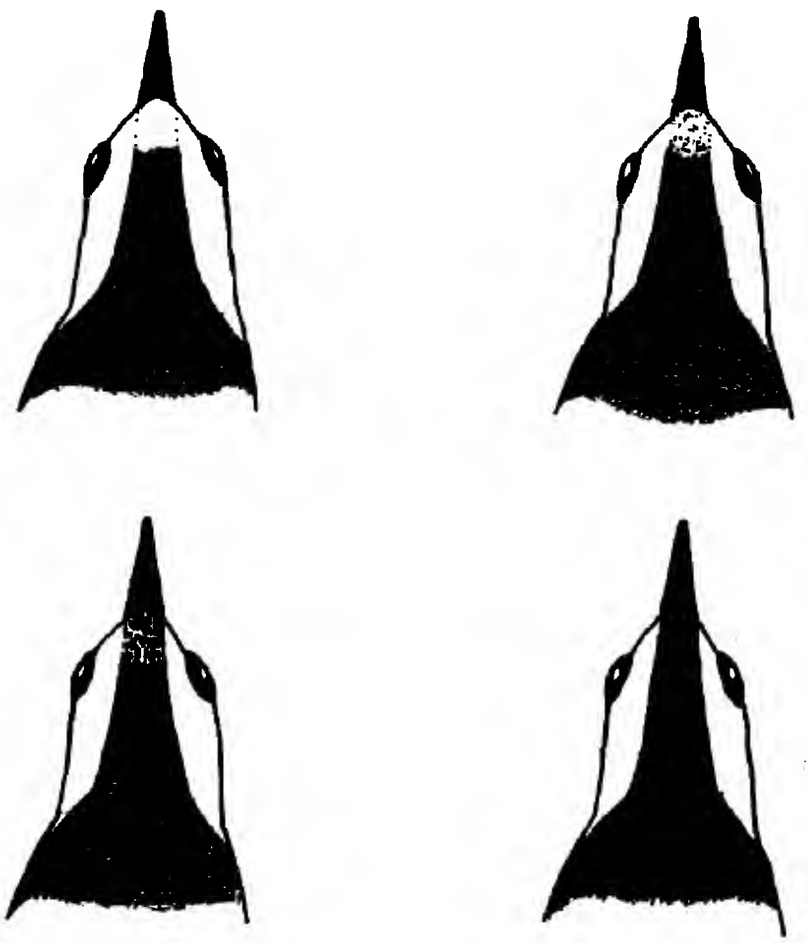

Figure 1. Chin/throat patterns of White and Black-backed wagtails in alternate plumage.

RESULTS AND DISCUSSION

Chin Color

I assessed the chin color of each specimen by means of four categories: white, whitish, sooty, and black (Figure 1). Whitish chins were mostly white, variably flecked with black; sooty chins were mostly black, flecked with white.

Morlan (1981) stated that females of *lugens* "can be distinguished [from *ocularis*] by their white chin and upper throat" but then said that eight out of 24 females showed black on the chin. Gibson (1983) stated that the adult female *lugens* has "chin, throat, and back like both sexes of White Wagtail." The NGS (1983, 1987) shows a "breeding female" *lugens* with a white chin and upper throat, while WBSJ (1982) also shows a "female summer" *lugens* with a white chin and upper throat.

My results (Table 1) show that in *lugens* a white chin is more typical of adults than of immatures, ten (28.5%) of which had an all-black chin. Also, even a sooty chin can appear all-dark, and careful views are needed to see this feature clearly. Interestingly, three first-year specimens of *ocularis* had a whitish chin.

In most cases chin color is not diagnostic, though it may be useful in combination with other characters. It appears diagnostic only for those *lugens* that have a clean white chin, and for adult *ocularis* with a solidly black chin.

Back and Rump Color

I estimated the percentage of black on the back and rump (Table 1), and further divided the rump into upper and lower (Figure 2); typically, the upper tail-coverts of both forms are black.

Table 1 Chin, Back, and Rump Color of Black-backed and White Wagtails in Alternate Plumage

		Chin				Back	Upper Rump	Lower Rump
	n	black	sooty	whitish	white	(% black)	(% black)	(% black)
Black-backed								
1st-year ♂	23	7	5	2	9	15-100	0-100 (53)[a]	20-100 (90)
2nd-year ♂	10		3	3	4	20-100	10-100 (40)	75-100 (94)
Adult ♂	10		2	1	7	95-100	20-100 (77)	80-100 (97)
1st-year ♀	12	3	2	1	6	0-15	0-25 (8)	10-100 (60)
Adult ♀	9		1	2	6	0-80	0-60 (20)	20-100 (79)
White								
1st-year ♂	14	6	7	1	—	0	0	0-75 (40)
Adult ♂	31	24	7	—	—	0-2	0	5-90 (50)
1st-year ♀	10	3	5	2	—	0	0	0-50 (24)
Adult ♀	7	6	1	—	—	0	0	10-45 (21)

[a] Mean value in parentheses.

Morlan (1981) correctly pointed out that female *lugens* in summer can be gray-backed and "may resemble *ocularis* closely, particularly in the first year when the white in the wing is not fully developed." Gibson (1983) stated that the adult female *lugens* has a "back like both sexes of White Wagtail" and that females of the two are "probably inseperable." Only three females of *lugens* I examined (two first-year, one adult) had an all-gray back but six others had so little black, always on the scapulars, that it might be difficult to see in the field. All first-year males of *lugens* had at least some black mottling on the back that should be noticeable in the field. The lower rump of all specimens of *lugens* showed some black and often was solidly black. Only eight of these had an all-gray upper rump (one first-year male, five first-year females, two adult females).

The sexes of alternate-plumaged *ocularis* are similar. Both male and female have a gray back and upper rump, typically with the lower rump contrastingly darker gray and usually mottled black. The back of most specimens of *ocularis* is a brighter, clearer (or bluer) gray than the relatively dusky gray back of *lugens*, but some approach the dusky gray of *lugens*. Rarely, *ocularis* has slight black mottling on the back (Table 1), though this may indicate an intergrade with *lugens*.

The most visible of these characters is the clearer, brighter blue-gray back of *ocularis* versus the darker, duskier gray back of *lugens*, but judgment of this in the field probably requires prior experience with one or both forms. In addition, a solidly black lower rump and black mottling on the upper rump indicates *lugens*, while an all-gray upper rump and slight or no black mottling on the dark gray lower rump indicates *ocularis*. The rump pattern, however, may be difficult to see or judge in the field and should be used in conjunction with other characters.

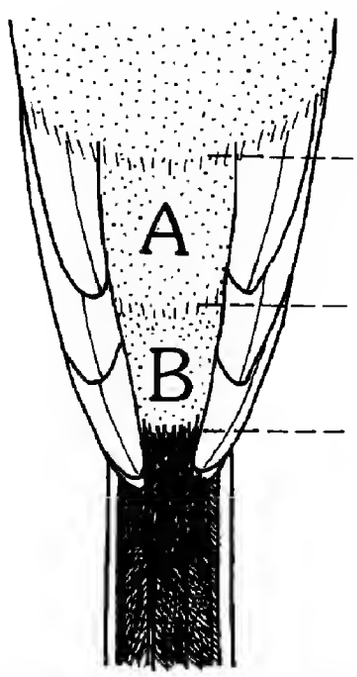

Figure 2. Distinction between upper rump (A) and lower rump (B) of White and Black-backed wagtails.

Wing Pattern

Birds in first alternate plumage retain their juvenile flight feathers, which, in both species, are similar: the remiges are dark brownish, narrowly edged whitish, and often become noticeably faded by spring. Although NGS (1987) stated that immature *lugens* has a whiter base to the flight feathers than does *ocularis*, this character is not readily evident in specimens with folded wings; consequently I did not evaluate it. It is worth noting, however, that photographs of hand-held first-year *lugens* show a distinct whitish stripe across the bases of the remiges (Bird Migration Research Center 1983); unfortunately, I have not found comparable pictures of *ocularis*.

Following the second prebasic molt, the remiges of *lugens* are mostly white and hence quite different from those of *ocularis* (see below). Several specimens of *lugens* (intergrades with *ocularis*?) had the outer two or three primaries mostly dark, as in *ocularis*. The primaries of adult male *lugens* are similar to the second-generation feathers but average more extensively white. In female *lugens*, individual variation makes the distinction between second-generation and older remiges difficult, and I was unable to distinguish these age classes with confidence, although Morlan (1981) stated that "adults differ from second-year birds in the greatly increased amount of white in the wing."

In *ocularis*, the remiges of the second and subsequent basic plumages are similar to the juvenal feathers but darker, with more contrasting white edges. By spring, however, they may fade and appear similar to first-year remiges.

Typically, at least one or two tertials are replaced during the first winter. Morlan (1981) stated that, after the first year, the edges of the tertials become more broadly white in *lugens* than in *ocularis*. I found that the thickness and pattern of white tertial edgings vary greatly within *lugens*, such that individual variation is as great as age-related or sex-related variation. Variation within *ocularis* was slight and the typical pattern was matched by several *lugens*, though all birds with mostly or entirely white outer webs to the tertials were male *lugens*. There appeared, however, to be a difference in the intensity of the white, and specimens of *lugens* with patterns similar to that of *ocularis* had brighter white tertial edgings.

Thus, the birds with mostly white remiges are *lugens*, but mostly dark wings characterize first-year *lugens* and all *ocularis*. Tertial pattern is unhelpful except for some males of *lugens*, which can be readily identified by other characters, e.g., extensive black on the back. The apparently brighter white of the tertial edgings of *lugens* is evident when series of specimens are compared but is unlikely to be useful in the field. The whiter base to the flight feathers of *lugens* may be apparent in the field.

Tail Pattern

Males of *lugens* of all ages rarely show some white mottling on the inner web of rectrix 4, i.e., the third from outermost rectrix. No specimen of *ocularis* showed this feature. More consistent, but of limited field use, was that 85% of *lugens* (of both sexes) had the basal portion of the fourth rectrix shaft white (Figure 3B), typically more extensive in males. However, four first-year males and one first-year female had the fourth rectrix shaft dark brown (Figure 3A). In *ocularis*, typically the shaft of rectrix 4 was dark (Figure

3A); a few birds had a slight whitish streak along the shaft which was difficult to see in the hand and probably would be invisible in the field. The white shafts on most specimens of *lugens* were quite bright, clearly more so than the effect caused by light reflected from a shiny dark shaft.

Therefore, a bright white shaft to rectrix 4 indicates *lugens*, but birds with an all-dark shaft rectrix 4 could be either *lugens* or *ocularis*. Observing this character in the field would be difficult but not impossible, given patience and luck.

Bill Size

Morlan (1981) stated that "the culmen of *ocularis* averages slightly shorter: 10.1 mm to the nostril vs. an average of 10.3 mm for *lugens*" in the specimens he measured. I measured the bills of 86 specimens of *lugens* (47 male, 39 female) and 77 of *ocularis* (43 male, 34 female), from the anterior end of the nostril to the tip of the maxilla. Males of *lugens* measured 9.3-11.2 mm (mean 10.2), females of *lugens* 9.2-10.8 mm (10.0); males of *ocularis* measured 8.5-10.2 mm (9.4), females of *ocularis* 8.5-9.8 mm (9.2).

From these measurements, as well as simply standing back and looking at the specimens, *lugens* clearly averages larger-billed than *ocularis*, far more so than might be interpreted from Morlan's figures. Part of the visual difference, not evident from these measurements, is accounted for by the associated greater bill depth of *lugens*; one also should remember that size (i.e., volume) increases as a cube of increase in length. With experience, bill size might be useful in the field, as it is with *Empidonax* flycatchers, even though absolute length differences are not great.

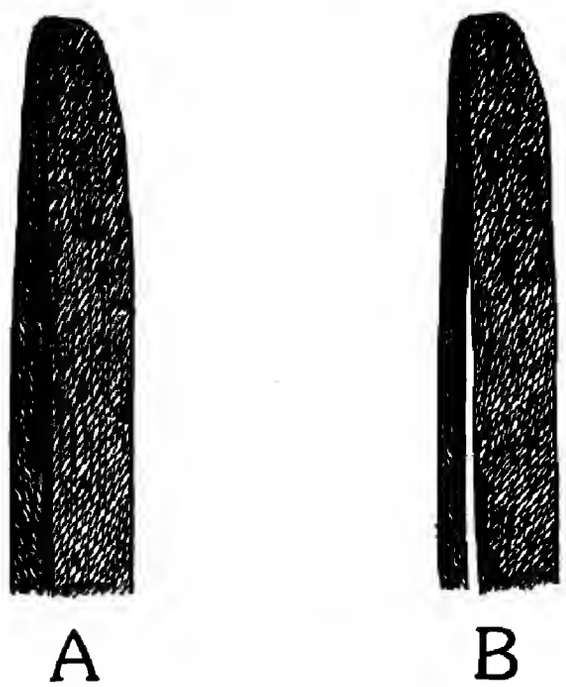

Figure 3. Patterns of rectrix 4 in White and Black-backed wagtails. A, *ocularis*, some *lugens*; B, most *lugens*.

Identification Problems

Birds with an extensively black back and/or birds that appear extensively white-winged in flight are *lugens* (with the potential exception of partly albino *ocularis*). However, gray-backed birds with dark wings and a blackish throat are not necessarily *ocularis*.

Two females of *lugens* in first alternate plumage (AMNH specimens 29915 and 29917) could easily be taken for *ocularis*, particularly as their throats are sooty. Their rumps show very little black and, in the field, extremely good views would be needed to see the slight black mottling on the scapulars. AMNH 29915 was collected at "Bering Is." on 11 May 1882; AMNH 29917 was collected at "Petrop. (= Petropavlovsk), Kamchatka" on 15 May 1883. Both, therefore, are from the breeding range of *lugens*.

Figure 4 shows a lineup of *lugens* and *ocularis*, including the two problem birds. AMNH 29915 was identified as *lugens* by Leonhard Stejneger; later, Charles Vaurie amended the identification to *ocularis*, presumably on account of the black chin and throat. However, 29915 has a white shaft to rectrix 4, slight blackish mottling on the scapulars, and a bill length from nostril of 10.0 mm. In all these characters it agrees with *lugens*. The identification of 29917 (bill from nostril 9.8 mm) as *lugens* has not been questioned although it is very similar to 29915. Also, MCZ 276409, labeled *lugens* (bill from nostril 9.6 mm), is extremely similar to the two AMNH birds.

Regardless of their parentage, all three represent identification problems and observers should consider the possibility of intergrade *lugens* × *ocularis* occurring on the west coast of North America.

CONCLUSIONS

The distinctions between alternate-plumaged Black-backed and White wagtails are confused in the literature. The first alternate plumage of female *lugens* and the alternate plumage of *ocularis* (especially females) are at best difficult to distinguish in the field. Even with a bird in the hand, one may be unable to rule out the possibility of an intergrade *lugens* × *ocularis*. Adult females of *lugens* in alternate plumage typically have a white chin and mostly white wings, striking in flight. In alternate plumage, males of *lugens* of all ages have an at least partly black back.

A gray-backed, black-throated, dark-winged wagtail presents the greatest problem. However, careful consideration of the following points should allow the majority of such birds to be identified.

An extensively white chin indicates *lugens*, but in their first year many examples of *lugens*, like *ocularis*, have a black throat.

Some specimens of *lugens* have a gray back like *ocularis*, but most show at least slight black mottling, especially on the scapulars. Typically, *ocularis* has a cleaner, brighter blue-gray back than the darker, dusky gray back of *lugens*, but a few have a dusky gray back.

Black mottling on the upper rump and a solidly black lower rump indicate *lugens*. A gray upper rump and relatively little black mottling on a darker gray lower rump indicate *ocularis*. Examples of *ocularis* with the most black on the lower rump are adult males, which usually have a brighter, bluer gray back than does female *lugens*.

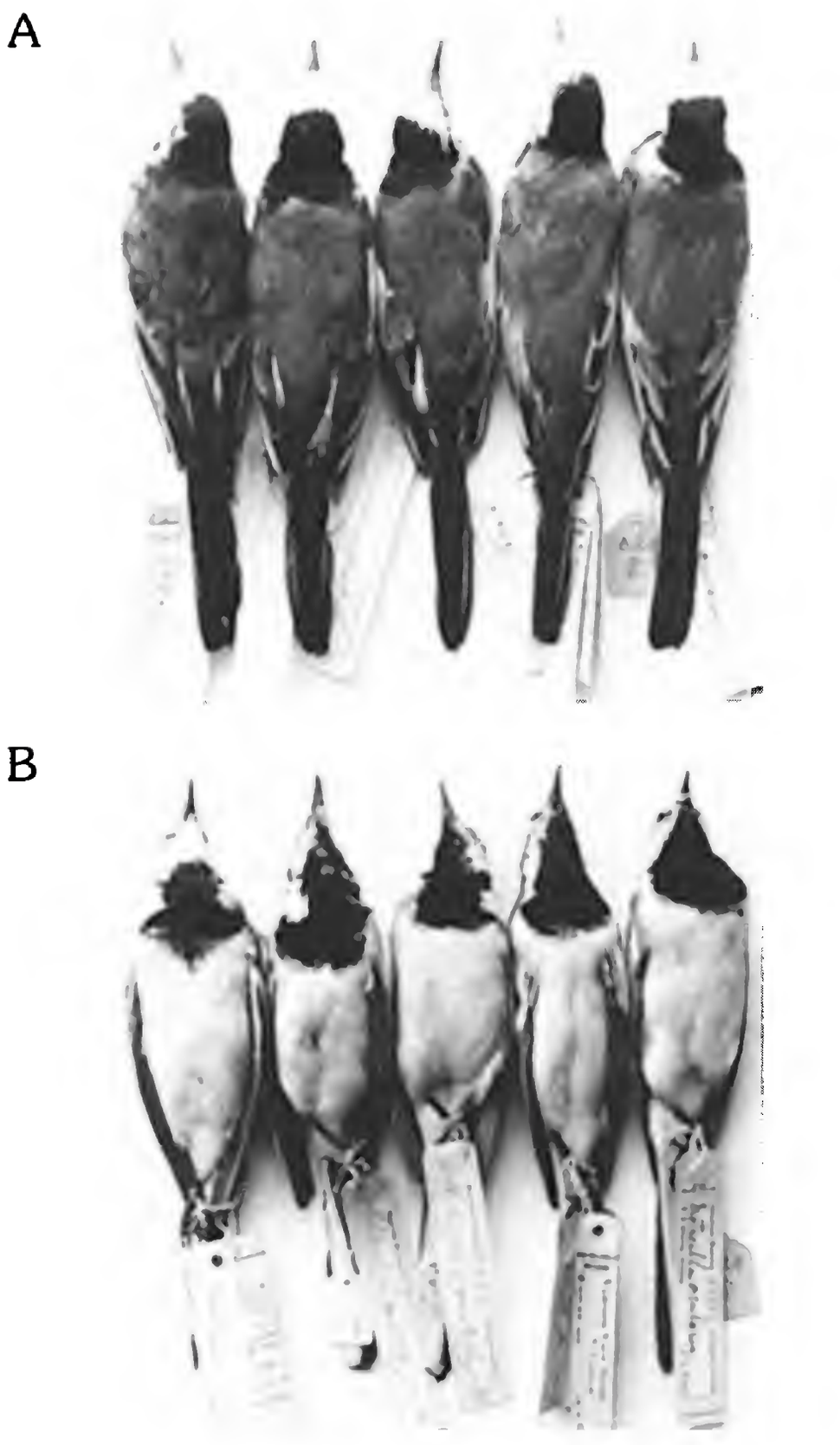

Figure 4. Five specimens in AMNH. Left to right: 56951 (first-year female *lugens*), 29917 (first-year female *lugens*), 29915 (first-year female *lugens*), 77331 (adult female *ocularis*), 77325 (adult male *ocularis*). A, dorsal view. Note extensively black rump and relatively dusky gray back of *lugens*. B, ventral view. Note black and sooty throat, respectively, of 29915 and 29917.

Photos by Steve N. G. Howell

The wing pattern of first-year *lugens* is similar to that of *ocularis*, although *lugens* often shows whiter tertial edgings; this difference is subjective, however, and there is overlap in pattern. A whitish base to the flight feathers of *lugens* may be apparent in flying birds but was not evident from specimens.

Many specimens of *lugens* show a constrasting white basal half or more to the shaft of rectrix 4. On some, especially first-year birds, however, the shaft can be dark brown as on *ocularis*.

The bill of *lugens* averages larger than that of *ocularis* but judgment of this requires experience with one or both forms.

ACKNOWLEDGMENTS

I thank the curators and personnel at the American Museum of Natural History, the Museum of Vertebrate Zoology, the Museum of Comparative Zoology, and the British Museum who allowed me access to the skins in their care. I also thank Joe Morlan, Peter Pyle, Philip Unitt, and Sophie Webb for helpful comments on earlier drafts of this paper, and Joe Morlan for drawing my attention to the Japanese Bird-Banding Manual. This is contribution number 470 of Point Reyes Bird Observatory.

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Accepted 8 August 1990

White Wagtail

Photo by Alan Hopkins

PATTERNS OF WINTER SHOREBIRD OCCURRENCE IN A SAN FRANCISCO BAY MARSH

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Resource exploitation by shorebirds in marine environments is influenced to a large degree by the tidal cycle. The periodicity of the tides dictates where and when shorebirds will feed (Connors et al. 1981). Some shorebirds that find their prey by touch feed whenever tidal conditions permit, independent of ambient light levels (Goss-Custard 1969).

In this study, I counted shorebirds of nine species in two plots of equal sizes. All censuses were conducted within a fixed interval of tidal height during both the flood and ebb tides. With this important abiotic variable held constant, I addressed three hypotheses: (1) Shorebird numbers in winter are constant in one location at a fixed tidal height. (2) Shorebird numbers in one location do not change in the same tidal height interval on the ebb and flood tides. (3) Shorebird species are distributed in each plot equally (numbers of each species and total biomass of shorebirds within each plot are equal).

STUDY AREA AND METHODS

I conducted this study at Corte Madera Marsh, Marin County, California, inside San Francisco Bay (Figure 1). Once an extensive salt marsh, Corte Madera Marsh is now a complex of diked wetlands with only vestiges of remnant salt marsh. The marsh system is bounded on the north by Corte Madera Creek and on the south by San Clemente Creek. This study focused on shorebirds' use of Muzzi (direct tidal flow) and Marta's (muted tidal flow) marshes. These marshes were diked off from San Francisco Bay in the 1960s.

The mudflats in Muzzi and Marta's marshes are important feeding sites for shorebirds during both ebb and flood tides. I established two plots of approximately 4.5 hectares (150 m × 300 m) in each marsh. I refer to these plots as the plot under direct tidal flow (Muzzi) and the plot under muted tidal flow (Marta's). The mudflats within both plots are several feet above those on the bay side of the dikes. During the flood tide these are the last areas to be inundated; shorebirds concentrate here to feed before the flats get covered when the tide reaches +5 feet. Shorebirds retreat to nearby roost sites when the tide exceeds +5 feet. The first mudflat to be uncovered when the tide begins to ebb is the plot under direct tidal flow, where shorebirds then concentrate. At low tide shorebirds move out onto mudflats in San Francisco Bay to forage.

The plot under direct tidal flow is bordered on two sides by dikes (breached in several places in 1976) and on two sides by salt marsh. The plot encompasses the only extensive mudflat within Muzzi Marsh; the remainder is salt marsh composed of *Salicornia virginica* and *Spartina foliosa*. This mudflat is similar in size to the mudflat in the plot under muted tidal flow and lies about 5 feet above the 0.0 tideline.

The plot under muted tidal flow is a diked tidal pond. The pond has a tidal gate at its western end along San Clemente Creek, which empties the marsh. The drain imparts a lag in the tidal cycle so that the cycle in this pond is several hours later than that of the bay and mutes the tidal flow. The plot is covered when the water level reaches about +4.5 feet during the flood tide but remains a mudflat throughout the flood-tide census interval. The lag time within this pond is a function of the tidal amplitude and the amount of runoff in San Clemente Creek. The mudflat in the plot under muted tidal flow becomes covered slightly later on the flood tide than does the plot under direct tidal flow. In addition, this pond remains full during the ebb census because of the lag and is not used by shorebirds for feeding at this time. The vegetation is the plot under muted tidal flow consists primarily of *Salicornia virginica* distributed along the periphery of the pond.

I conducted censuses from one fixed point for each plot by using a 20× scope, 10× binoculars, and handcounters to count shorebirds. The mudflats were small enough to allow an easy count of all shorebirds present. For each census the time the tide took to rise or fall from one limit of the specified interval to the other, duration of the census, weather, notable shorebird behavior (such as territoriality), raptor presence, and human disturbance were recorded. Censuses were not conducted in the rain or on days when the tidal interval was misjudged.

Both plots were censused on 21 days from 30 September 1988 to 11 March 1989 at roughly 7-day intervals. Censuses were conducted from +3.5 to +4.5 feet on the flood tide and from +4.5 to +3.5 on the ebb tide. During these tidal intervals, chosen early in the fall (July–September 1988), high concentrations of shorebirds fed on the two plots (as shown by observations through the complete tidal cycle). During the flood-tide interval, similar areas of mudflat were exposed within each plot. In addition, there was little change in mudflat area during the flood-tide interval; incoming water during this interval went mostly toward filling tidal channels cut into the mudflat. Because of the complexity of the tidal regime in San Francisco Bay it was necessary to get to the census points well before the tide level predicted from tidal charts. I placed a stake in the plot under direct tidal flow to determine when to begin and end censuses.

Censuses took from 60 to 90 minutes. The height of the tide remained within the specified interval for approximately 60 to 120 minutes, the time varying primarily as a function of tidal amplitude. I remained in the area throughout the tidal interval. For each of the nine study species, I averaged the results of three counts taken in close succession. This method gave a precise count of shorebirds present, as standard deviations of arithmetic means were always fairly small.

Because the two plots were small and juxtaposed, I could conduct censuses simultaneously and note any shorebird movement between the two plots. There was usually little interplot movement during the censuses. When there was movement into or out of the area as a whole during a census, I counted the maximum number of shorebirds present at one time during the interval.

All shorebird species were counted, but only nine occurred regularly (Table 1). Two broad distributional divisions exist among the nine study species: five breed in high latitudes (arctic and subarctic) and four breed in middle latitudes (one of these, the American Avocet, breeds in San Francisco Bay).

I used the coefficient of fluctuation (CF) (Whittaker 1975; see also Holmes et al. 1986) to assess variability in the winter abundance of each species. The CF is an index of population fluctuation based on logarithms and measures fluctuation around the geometric mean. Because

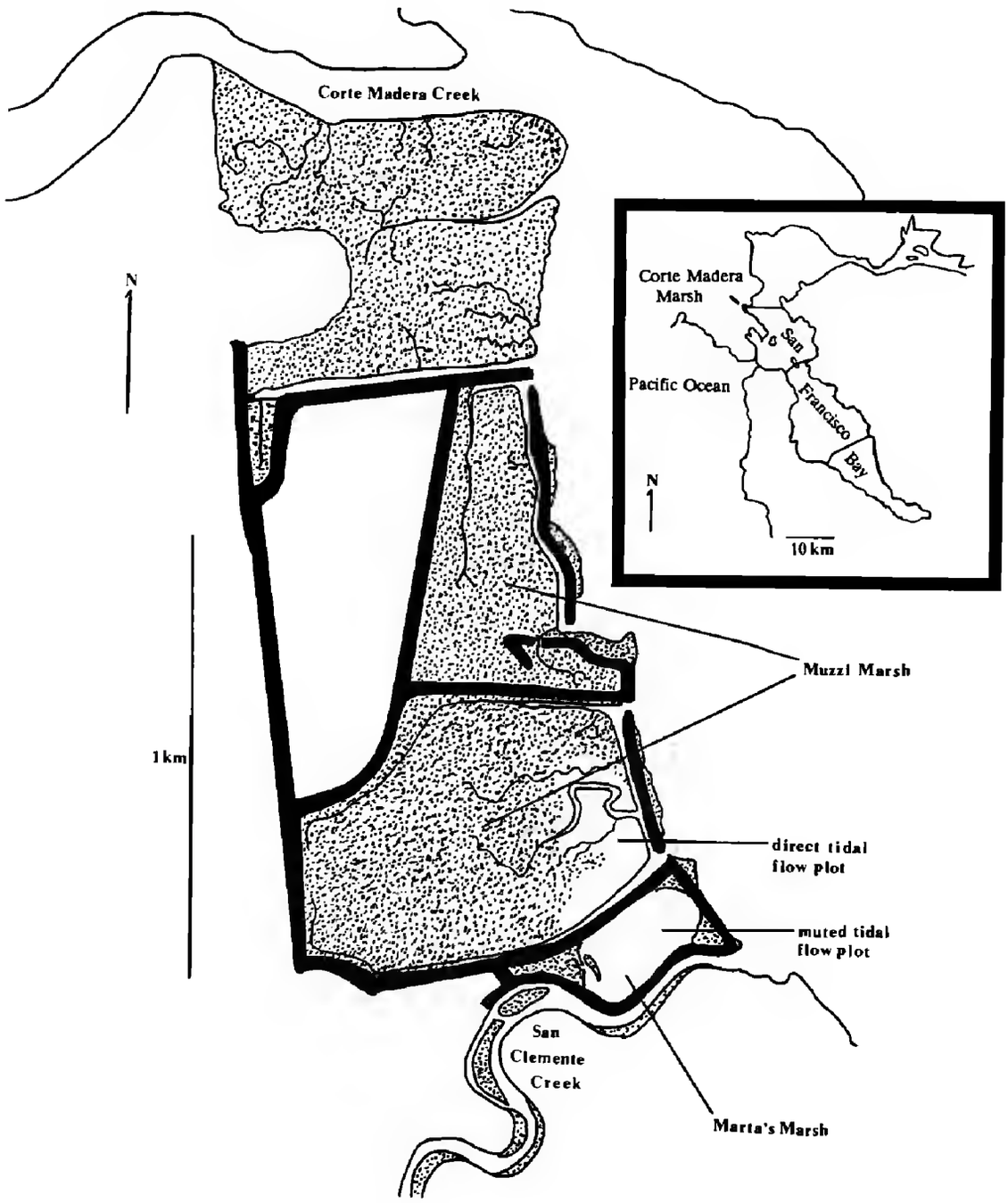

Figure 1. Corte Madera Marsh, Marin County. Stippled area, *Salicornia-Spartina* marsh. Inset, location of study site on San Francisco Bay.

the CF is based on logarithms, it is less affected by absolute differences in population size (as between species) than the coefficient of variation (Whittaker 1975). In other words, populations of different sizes that are fluctuating by the same amount will have comparable CFs. Population sizes used in calculating CFs were the flood-tide totals from both plots combined. Because each species has a unique migration schedule, I used the "winter" periods for each species specified by McCaskie et al. (1979) as the periods of uniform seasonal abundance inclusive of the dates of this study. This simplification is crude, but less so than arbitrarily assigning one wintering period for all nine species. With only two exceptions (see Results), the winter schedule of each species completely overlapped the duration of this study. I used the weights listed by Page et al. (1979) to calculate biomasses and Wilcoxon matched-pair signed-rank tests to test the differences between the plots in shorebird biomass and between the flood- and ebb-tide censuses (Sokal and Rohlf 1981, Mathcad 1988).

RESULTS

Variation in Numbers

By sampling within one tidal height interval, I fixed the principal variable affecting shorebird presence in the two plots. Numbers of Willets (*Catoptrophorus semipalmatus*), Long-billed Curlews (*Numenius americanus*), and Least Sandpipers (*Calidris minutilla*) fluctuated erratically all winter. Although the CFs for these species were not as high as those of others (Table 1), the occurrence of the three in the plots seemed random, showing no obvious patterns (Figures 2–4). The irregularity was

Table 1 Latitudes of Breeding, Mean Weights, and Coefficients of Fluctuation for Shorebirds Studied at Corte Madera Marsh, 1988-1989

Species	Latitude of breeding[a]	Mean weight (grams)[b]	Coefficient of fluctuation[c]
Black-bellied Plover	H	219.0	1.95
American Avocet	M	312.0	1.51
Willet	M	299.3	2.82
Long-billed Curlew	M	691.3	2.09
Marbled Godwit	M,H	371.4	1.17
Western Sandpiper	H	25.0	5.49
Least Sandpiper	H	20.5	3.16
Dunlin	H	50.1	6.76
Dowitcher spp.	H	113.6	1.70

[a]H, high latitudes (arctic and subarctic); M, middle latitudes.
[b]Data from Page et al. (1975).
[c]Antilog $[\Sigma(\log N_x - \log \tilde{N})^2/t - 1]^{1/2}$, where N_x is the species' abundance on day x and N is geometric mean density. The coefficient is unitless (Whittaker 1975).

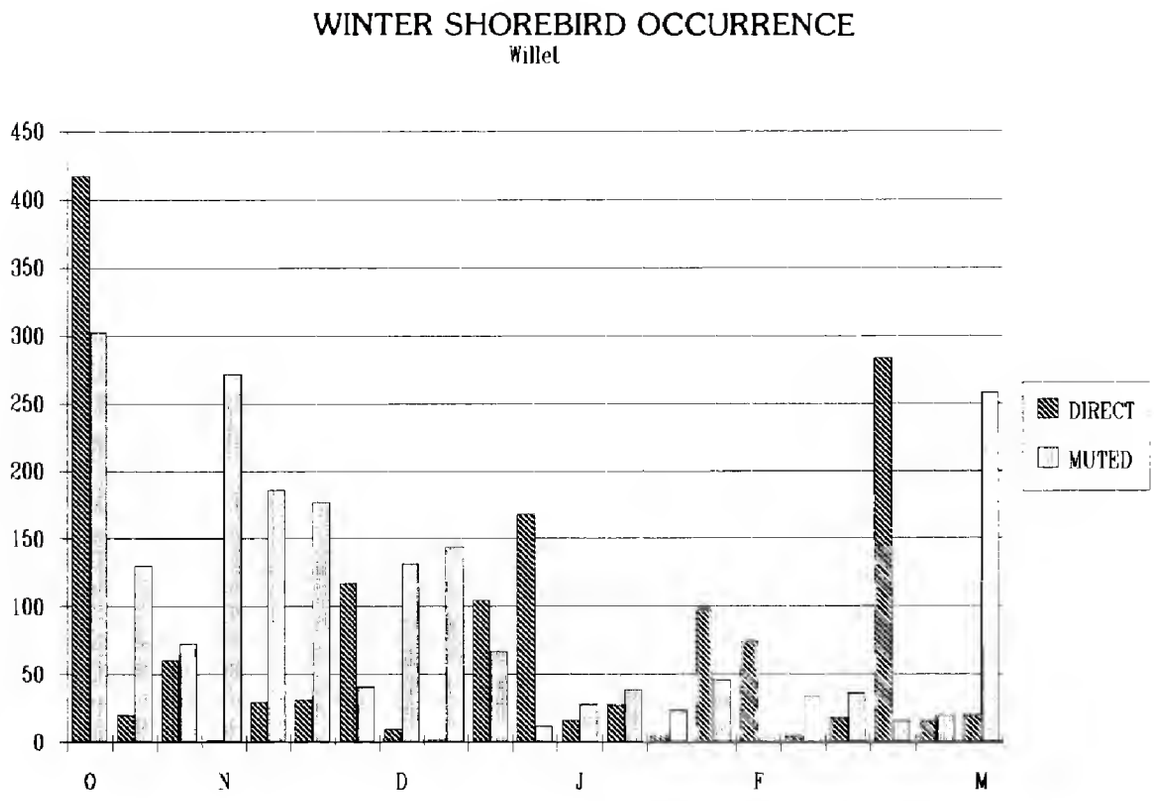

Figure 2. Flood-tide abundance of the Willet in the plots under direct and muted tidal flow at Corta Madera Marsh.

due at least in part to these species' preference for other foraging sites. Willets and Long-billed Curlews commonly fed in salt marsh when the

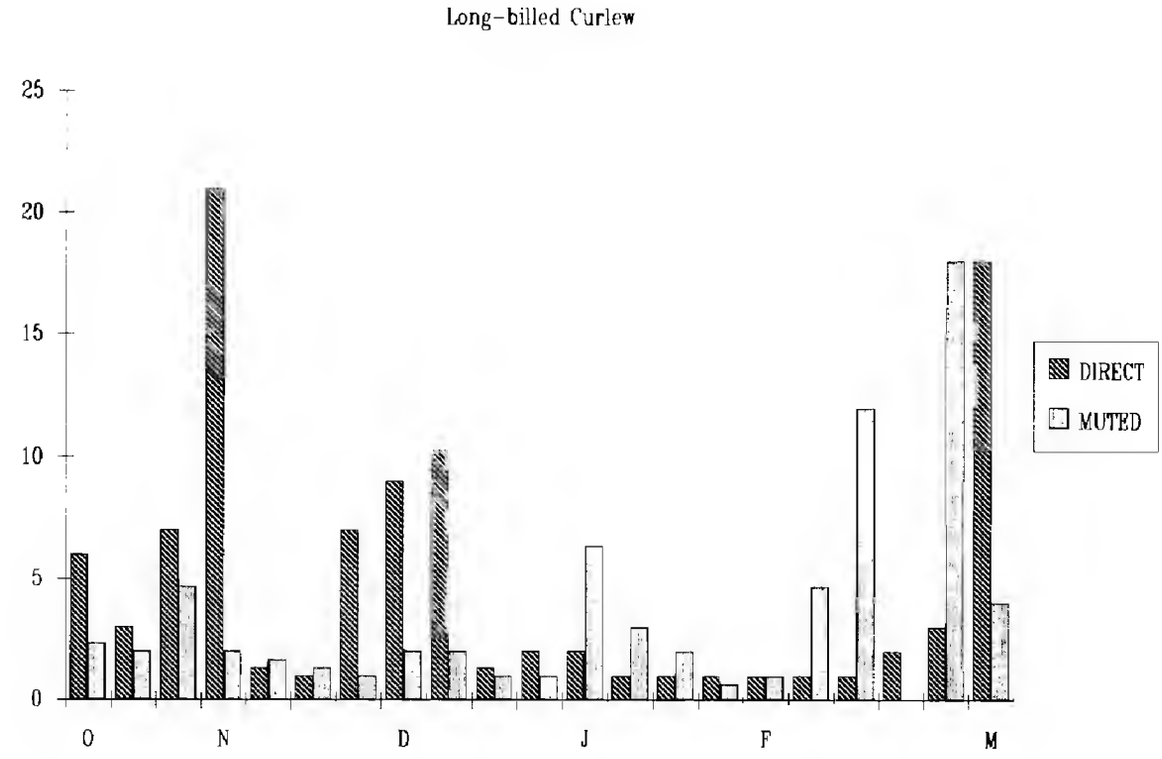

Figure 3. Flood-tide abundance of the Long-billed Curlew in the plots under direct and muted tidal flow at Corte Madera Marsh.

tide was high. Least Sandpipers often fed along tidal channels within the salt marsh or on high exposed mud outside of the plots.

The remaining six species foraged primarily within the two plots during the flood-tide interval. Through the winter, their numbers varied either little or in a nonrandom pattern. In general the mid-latitude breeders have a longer winter residency than do high-latitude breeders, but important differences within each distributional division exist as well.

The Marbled Godwit (*Limosa fedoa*) showed little variation in numbers through the winter (Figure 5). This species had the lowest CF (1.17) of any species (Table 1); Marbled Godwit numbers fluctuated by only about 17% above and below their geometric mean during the winter.

The American Avocet (*Recurvirostra americana*), dowitchers (*Limnodromus* spp.), and Black-bellied Plover (*Pluvialis squatarola*) also showed small fluctuations in abundance during the winter (Figures 6–8). CFs for these species were all less than 2 (Table 1); their fluctuations averaged less than two times the geometric mean. The American Avocet occurred in fairly regular numbers during the winter (early November to early March). Peaks of abundance in October and March probably represented influxes of migrants. It is not known what proportion of the wintering population in San Francisco Bay consists of local breeders or whether these local birds are resident in the bay.

In my analysis, I pooled data for the two species of dowitchers. Dowitchers remaining past mid-October were almost entirely Long-billed (*L. scolopaceus*); the high numbers in late October and November proba-

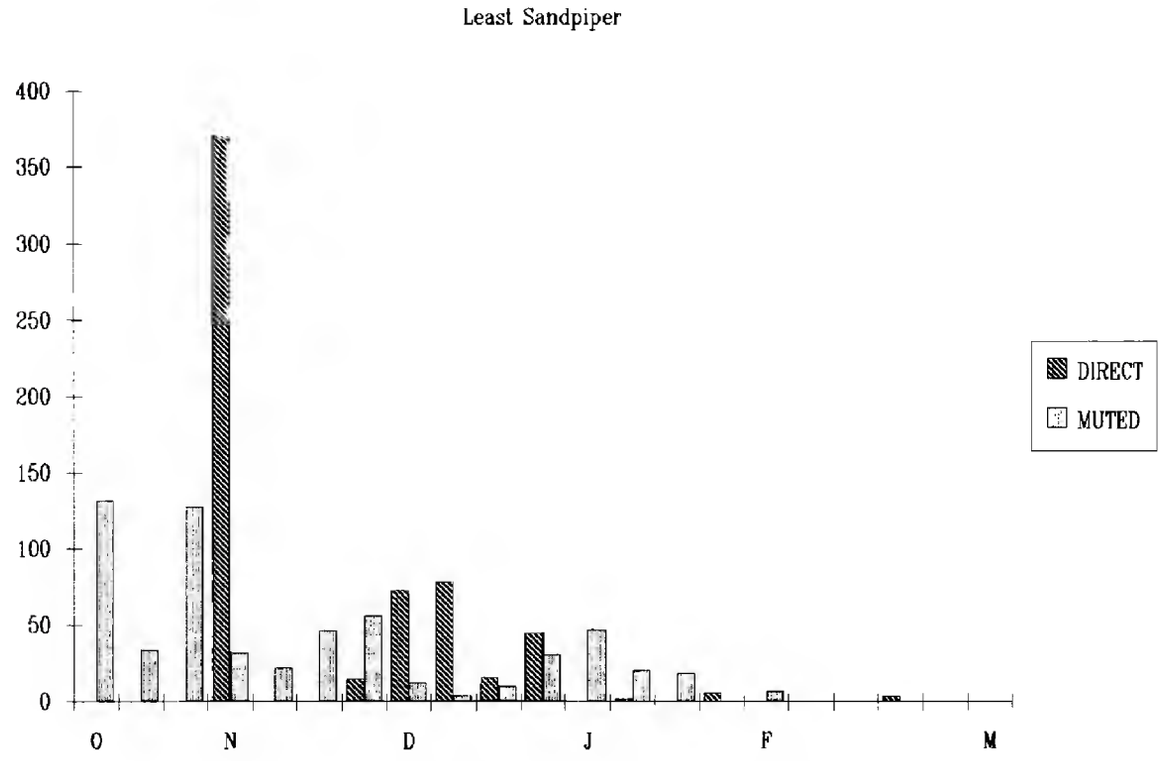

Figure 4. Flood-tide abundance of the Least Sandpiper in the plots under direct and muted tidal flow at Corte Madera Marsh.

bly represented an influx of migrants. The only Short-billed Dowitchers (*L. griseus*) detected (by call) in winter were in the plot under direct tidal flow, which was seldom used by Long-billed Dowitchers on the flood tide (Figure 7). Fewer than five Short-billed Dowitchers wintered in the vicinity, but this species was common in passage from July to September and during that time used primarily the plot under muted tidal flow.

Black-bellied Plovers occurred in fairly stable numbers all winter but demonstrated no clear preference for either of the two plots (Figure 8).

The Western Sandpiper (*Calidris mauri*) and Dunlin (*C. alpina*), which typically fed and flocked together, exhibited similar patterns of fluctuation during the winter (Figures 9 and 10). Both of these species had distinct peaks of abundance in November and January followed by a rapid attenuation in abundance in midwinter. The congruency of these patterns is intriguing because the molt and migratory schedules of the two species are so different. Western Sandpipers molt in migration and on the wintering grounds (Holmes 1972) and pass through this latitude from July through September. This species was common in the plot under muted tidal flow in July and August (mostly adults) and abundant from August to into September (mostly juveniles). Unlike Western Sandpipers, Dunlins migrating down the Pacific coast of North American molt on or near their arctic breeding grounds (Holmes, 1966, 1971) and pass through this latitude in October and early November (the winter period of this species begins in late October). The first Dunlins on the study plots arrived in late September.

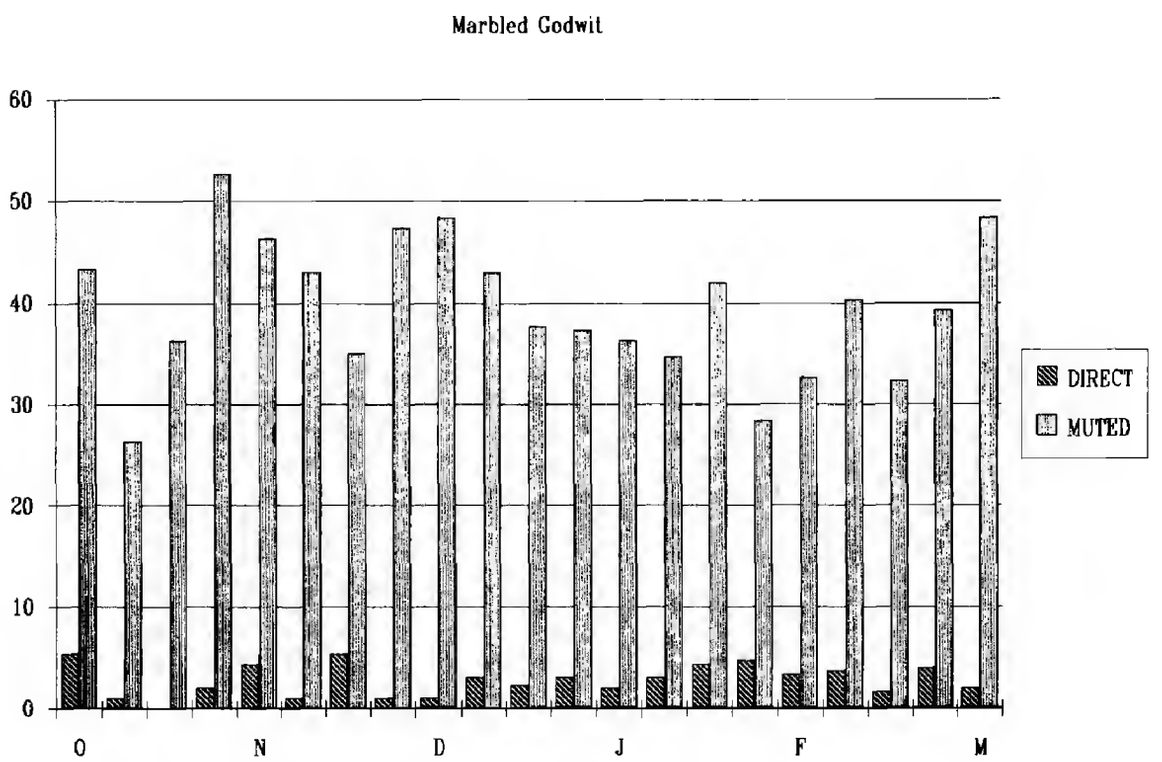

Figure 5. Flood-tide abundance of the Marbled Godwit in the plots under direct and muted tidal flow at Corte Madera Marsh.

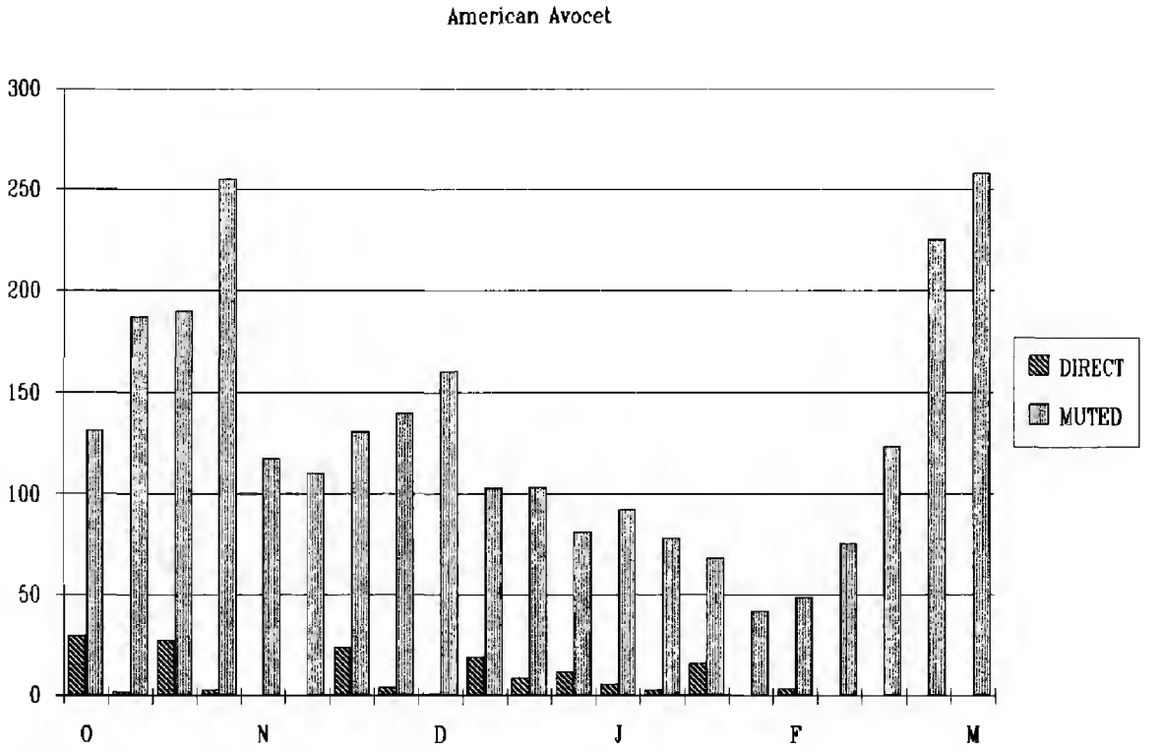

Figure 6. Flood-tide abundance of the American Avocet in the plots under direct and muted tidal flow at Corte Madera Marsh.

Flood–Ebb Comparisons

For all species, numbers counted during the flood-tide interval were higher than numbers counted during the ebb-tide interval (both plots

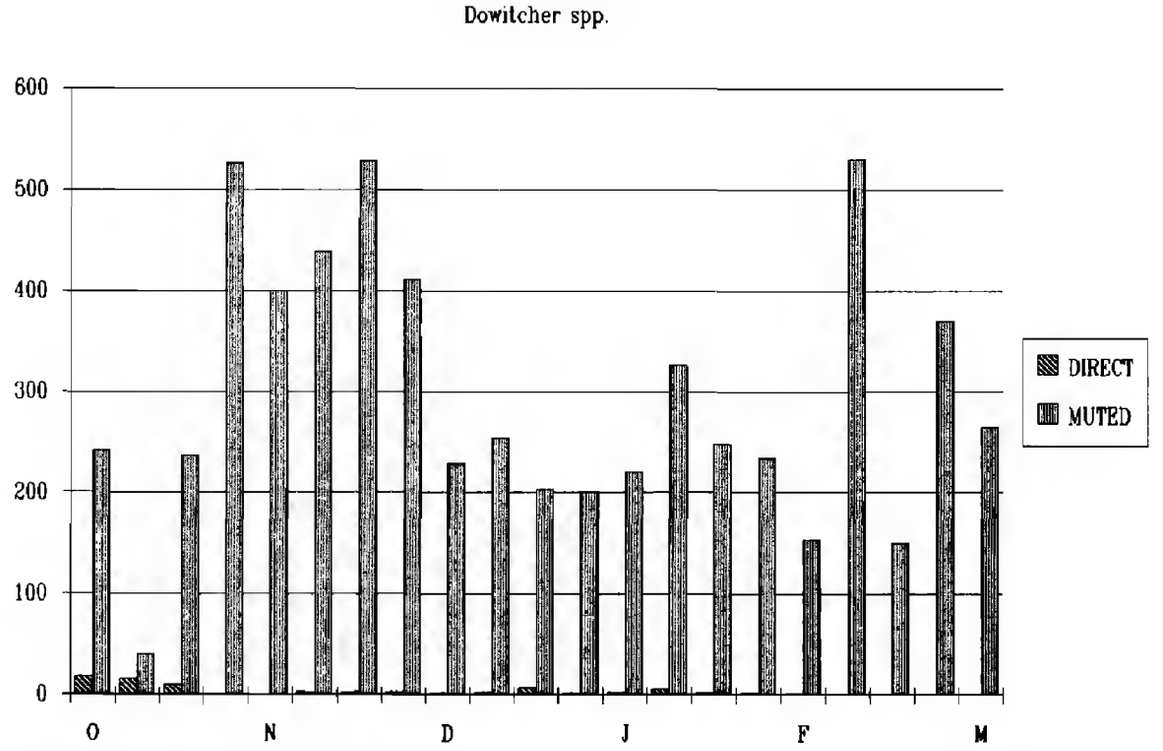

Figure 7. Flood-tide abundance of dowitchers in the plots under direct and muted tidal flow at Corte Madera Marsh.

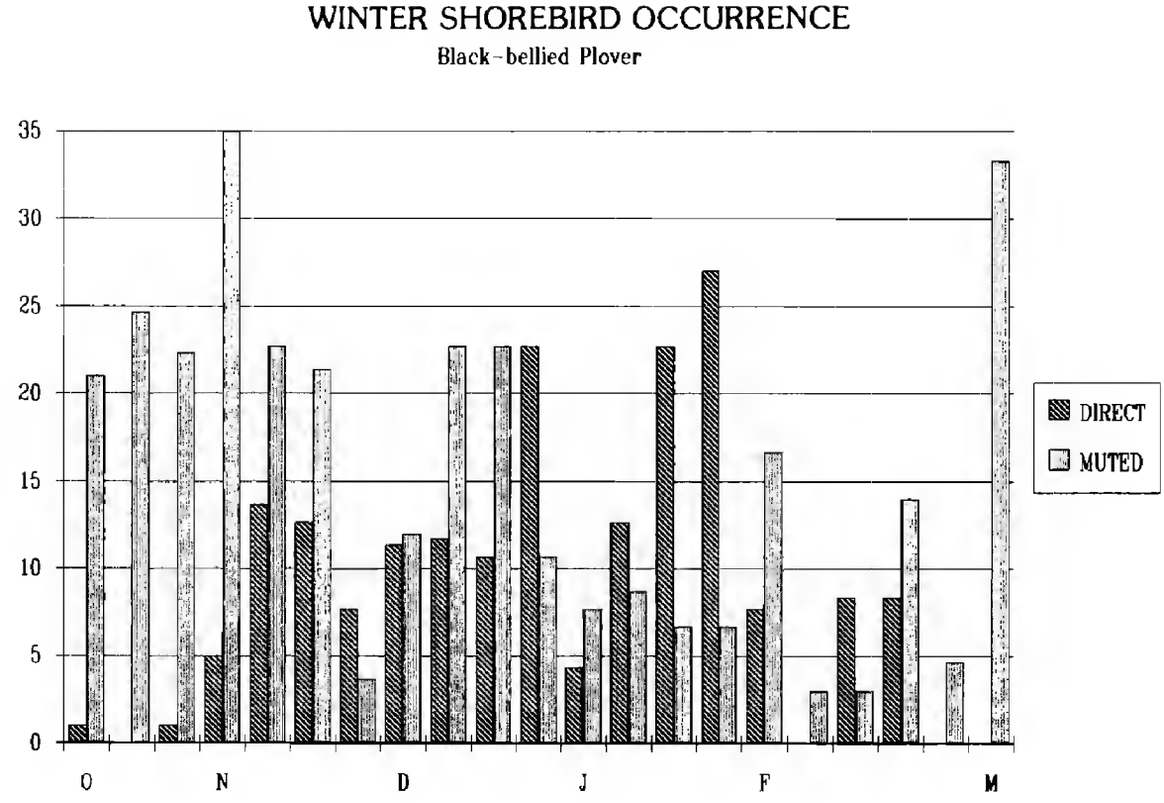

Figure 8. Flood-tide abundance of the Black-bellied Plover in the plots under direct and muted tidal flow at Corte Madera Marsh.

combined). This is most likely an artifact of the smaller (by 50%) mudflat area exposed during the ebb-tide interval. The plot under muted tidal flow remained full during the ebb census, so I could compare (by the

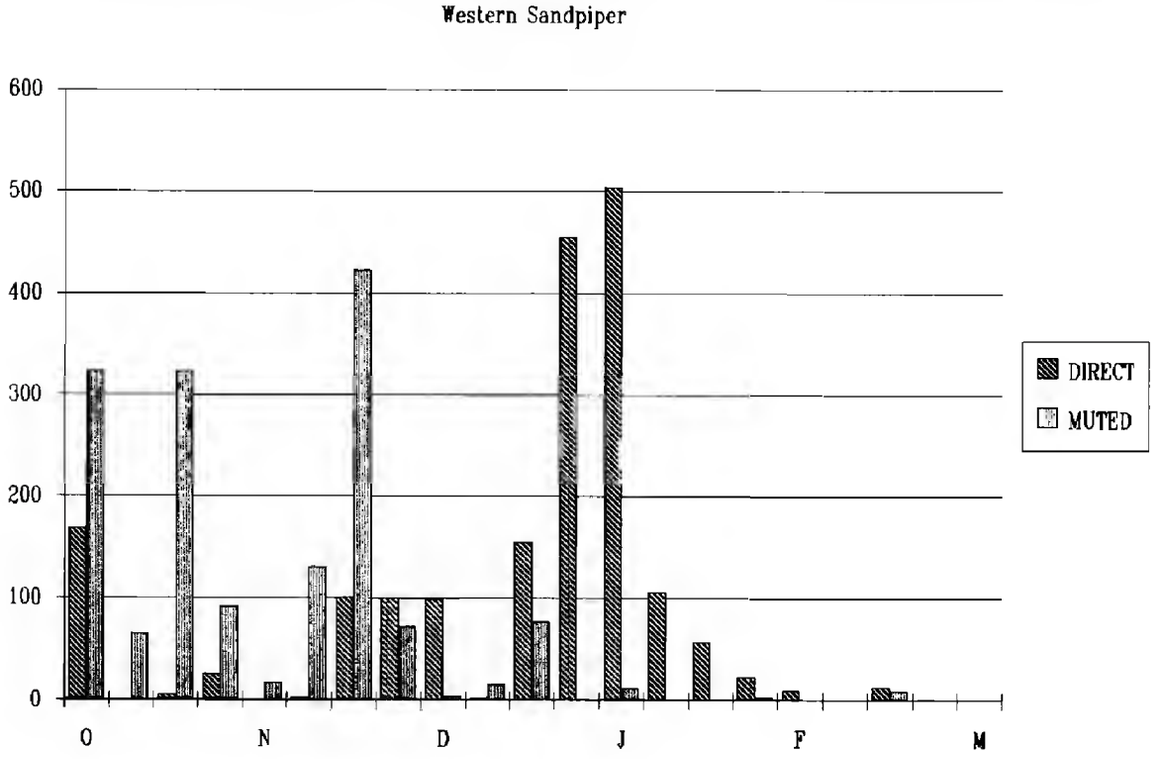

Figure 9. Flood-tide abundance of the Western Sandpiper in the plots under direct and muted tidal flow at Corte Madera Marsh.

Wilcoxon matched-pair signed-rank test) shorebird abundance during the flood and ebb tides only for the plot under direct tidal flow. Numbers counted during the ebb-tide interval were significantly greater ($p < 0.01$) than number counted during the flood-tide interval for all species except the Least Sandpiper and Dunlin, for which the difference was not statistically significant.

Most species remained at roost sites within the marsh throughout the ebb-tide interval. From late December through early February, however, mixed flocks of Western Sandpipers and Dunlins were consistently seen leaving high-tide roosts in Corte Madera Marsh during the ebb-tide interval without feeding. Flocks left Corte Madera Marsh toward either the south or southeast.

Comparison of Plot Use

Three species, the American Avocet, Marbled Godwit, and dowitchers, preferred the plot under muted tidal flow to the near exclusion of the other plot during the flood-tide census (Figures 5–7). Two species, the Western Sandpiper and Dunlin, favored the plot under muted tidal flow during the fall but shifted to the plot under direct tidal flow in early December and January (Figures 9 and 10) before leaving the area entirely in midwinter. Western Sandpipers showed a distinct preference for the plot under muted tidal flow during migration (July–September) as well.

The absolute biomass of shorebirds in each plot was significantly different. The plot under muted tidal flow supported a significantly higher shorebird biomass ($p < 0.005$; Wilcoxon matched-pair signed-rank test)

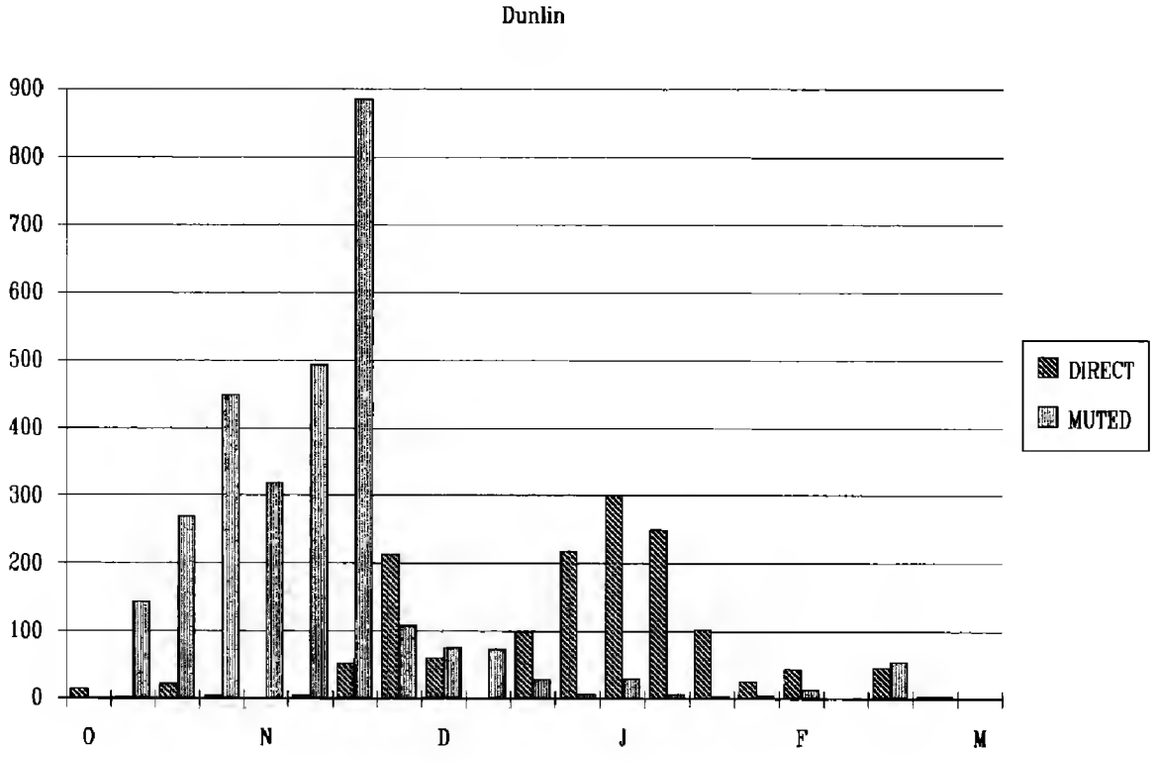

Figure 10. Flood-tide abundance of the Dunlin in the plots under direct and muted tidal flow at Corte Madera Marsh.

than the plot under direct tidal flow all winter (Figure 11). Shorebird biomass was lowest in early February; this depression coincided with a week-long cold snap. A small percentage of shorebirds roosted (rather than fed) in the plots during both tidal intervals, biasing these calculations to some extent, but the overwhelming majority of shorebirds fed in the plots.

DISCUSSION

Despite the unique morphology and foraging behavior of each species, all probably responded to local fluctuations in resource abundance and, as a result, may have shown congruent patterns of winter fluctuation (e. g., the seasonal variation in abundance of Western Sandpipers and Dunlins; Figures 9 and 10).

A late-winter diminution in Dunlin numbers has been described from other parts of San Francisco Bay (Storer 1951, Holmes 1966) and from Bodega Harbor, Sonoma County (P. G. Connors pers. comm.). Where Dunlins go in late winter is unknown; possibilities include a protracted spring migration up the Pacific Coast (Holmes 1966) or a shift from tidal mudflats to nontidal seasonal wetlands as these areas become available and profitable for feeding in midwinter. Ruiz et al. (1989) found that Dunlins wintering in Bodega Harbor constitute two subpopulations, each with distinct foraging patterns. If such subpopulations are a common feature in wintering populations of Dunlins, both of these processes could

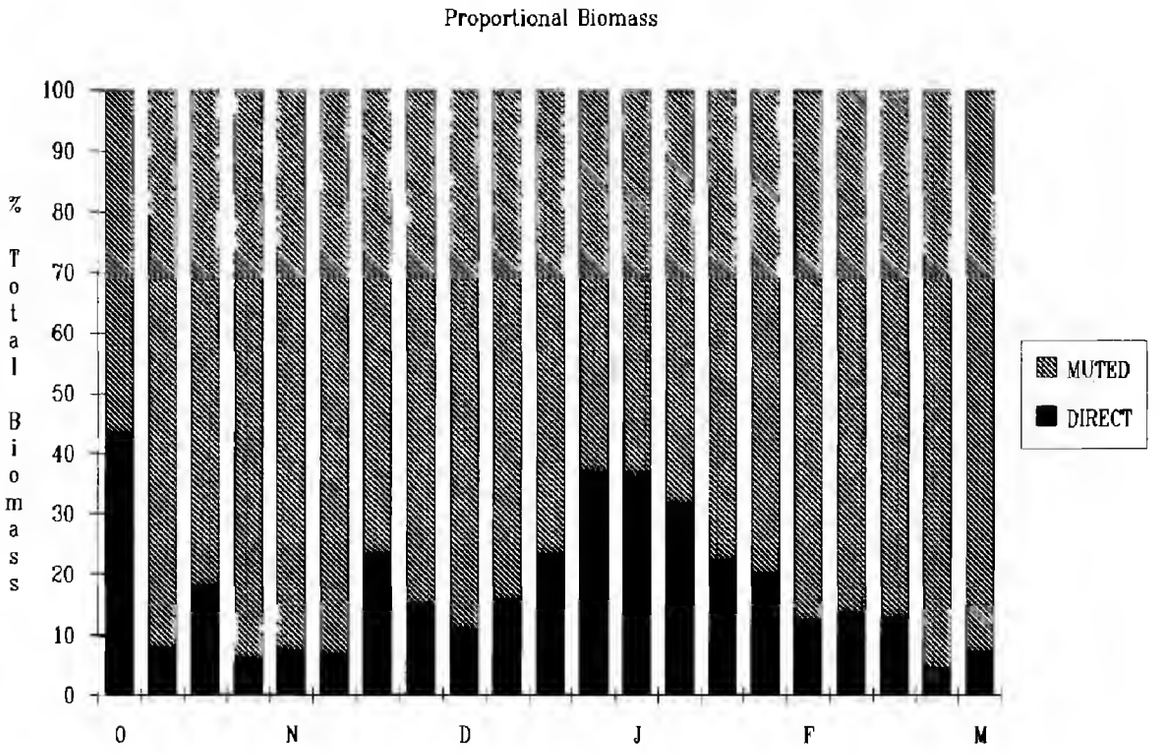

Figure 11. Proportional biomass of shorebirds in the plots under direct and muted tidal flow at Corte Madera Marsh. Calculated with weights from Page et al. (1979).

be important; successive pulses of Dunlins may pass through this latitude during spring migration. Large numbers of Dunlins do occur on San Francisco Bay in mid-April (Stenzel and Page 1988).

Numbers of birds in the plot under direct tidal flow during the ebb tide (when the other plot was unavailable for feeding) were a small fraction of those present in both plots during the flood tide. This suggests two possible ebb-tide feeding strategies: (1) Birds remain at high-tide roosts after feeding areas have been uncovered because they are not energetically constrained to maximize feeding time. (2) Birds move to new feeding areas as these become uncovered by the ebb tide, in order to maximize energy intake. Both tactics may be employed by individuals of some species, but consideration of these alternative strategies may help explain the behavior patterns of certain groups of species. The larger species (American Avocet, Willet, Long-billed Curlew, and Marbled Godwit) often loafed at high-tide roosts in the marsh after mudflats became exposed by the ebb tide, suggesting that these species were not under severe energetic constraints to maximize foraging time.

A different pattern I noted was the exodus of mixed flocks of Western Sandpipers and Dunlins from Corte Madera Marsh during the ebb tide, even though mudflat was exposed in the plot under direct tidal flow. If food was always made available when mud was uncovered, Western Sandpipers and Dunlins were passing up immediate resources in favor of prospective richer resources elsewhere. Perhaps the energy needs of these smaller birds demand that they maximize food intake. I saw none of the other study species leave the area during the ebb tide on a regular basis.

Vagility may vary from species to species owing to energetic demands caused by resource limitation. Smaller species (such as *Calidris* sandpipers) may depend on patchy, concentrated, or ephemeral resources and may be forced to forage widely in search of food. On an estuary as large as San Francisco Bay, roosting sites and feeding sites can be several kilometers apart if the energetic cost incurred by the commute does not exceed the profitability of foraging at a distant location. In contrast, a pattern of local winter residency has been demonstrated for some species of large shorebirds. Kelly and Cogswell (1979) found that a banded population of Willets and Marbled Godwits wintering in south San Francisco Bay showed little local movement. Ruiz et al. (1989) found that different levels of vagility may be important at the intraspecific level as well.

Both of my mudflat plots were used primarily for feeding by all of the study species during the flood-tide interval. It is therefore reasonable to infer that differences in shorebird abundance and biomass were primarily a result of differences between the plots in the resource base.

The midwinter shift between the two plots in abundance of Western Sandpipers and Dunlins (Figure 11) probably paralleled a change in the distribution and abundance of resources. A midwinter decline in prey items in the upper few centimeters of mud could have made the plot under muted tidal flow unsuitable for short-billed species (Western Sandpiper and Dunlin) but not for long-billed species (Marbled Godwit

and dowitchers). American Avocets fed primarily by straining the water column (mainly in tidal channels) so are exempt from this hypothesis. Observations of Western Sandpipers and Dunlins regularly leaving the marsh during the ebb tide are consistent with the idea that the area may have been resource-poor for these species and that richer areas existed elsewhere. An increasing depth of prey items has been found to be inversely related to intake rate in some shorebird species (Reading and McGorty 1978, Myers et al. 1980).

The patterns of shorebird occurrence that I found in this study probably result from resource heterogeneity on a spatial scale (between plots) and on a temporal scale (across the winter). A quantification of the resource base is central to any study of community structure, foraging behavior, or habitat selection. With no data on resources such a fit of patterns to processes can be only inferred. Aside from this, the spatial and temporal distributions of shorebirds on a local scale are clearly not uniform.

ACKNOWLEDGMENTS

This study was completed in partial fulfillment of the Senior Honor's Thesis at the University of California at Berkeley. The following people provided helpful suggestions and insightful comments: John Comstock, Peter G. Connors, Richard T. Holmes, Ned K. Johnson, Durrell D. Kapan, Brian J. McCaffery, Tim Manolis, Frank A. Pitelka, Lynne E. Stenzel, and an anonymous reviewer. Barbara Salzman and Roger Harris provided useful information regarding the study site. Finally, I am indebted to the logistical support of John Comstock and Richard and Gail Holway, without whose assistance and patience this study would not have been possible.

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Accepted 7 March 1990

FIRST RECORD OF THE BAND-RUMPED STORM-PETREL IN CALIFORNIA

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On 12 September 1970 a Band-rumped Storm-Petrel (*Oceanodroma castro*) was seen during an all-day pelagic boat trip off San Diego, San Diego County, California. I and more than forty other observers spent that entire day aboard a chartered sport-fishing boat exploring the waters off San Diego for pelagic birds, venturing as far off shore as the south end of San Clemente Island. When returning from San Clemente Island in the afternoon, at about 32°50¾ N, 117°50¾ W, some 25 to 30 miles off San Diego, the boat passed through an area that had attracted a large number of storm-petrels. I estimated there to be about 400 Black Storm-Petrels (*Oceanodroma melania*) and 600 Least Storm-Petrels (*Oceanodroma microsoma*), most in two large rafts on the water, this being very close to the same area where Miller (1936) encountered rafting storm-petrels in 1935. As the boat passed through the flock I saw a white-rumped storm-petrel flying northward some distance in front of the boat, then swing west as if to move around to the stern of the boat. Five minutes later what I assumed to be the same white-rumped storm-petrel had joined eight to ten Black Storm-Petrels following in the wake of the boat. It remained behind the boat for at least 20 minutes, coming to within 75 feet of the boat on a couple of occasions, but remaining between 100 and 200 feet behind the boat for most of the time. Low clouds reduced the glare of the sun, and the fact that the boat was moving in the same direction as the waves gave us a relatively stable deck from which to study the bird. We viewed the bird at leisure through 10× and 8× binoculars, openly discussing the marks noted, and even speculating that it might be a Band-rumped Storm-Petrel. I made the following notes.

The white-rumped storm-petrel was clearly smaller than the accompanying Black Storm-Petrels, and I judged it to be about the same size as the Leach's Storm-Petrels (*Oceanodroma leucorhoa*) seen earlier in the day. The wings appeared to be long and pointed, clearly being narrower than those of the accompanying Black Storm-Petrels. The tail appeared square-ended most of the time, but was seen to be slightly notched on occasions. The feet and legs were never seen, but the feet did not extend beyond the tip of the tail.

The bird had a distinctive manner of flight, remaining closer to the surface of the water than did the accompanying Black Storm-Petrels, and flying with four or five shallow but rapid wing-beats followed by a glide. When gliding the bird held its wings rigid and straight out from the body, and arched slightly downward at the tips. The manner of flight was more like that of a small shearwater than that of the storm-petrels normally encountered off San Diego, never having the deep wing-beats of the Leach's and Least storm-petrels or the lazy wing-beat of the Black Storm-Petrel.

This bird appeared to be blacker than the accompanying Black Storm-Petrels, but the gray bar on the upper wing-coverts appeared paler than that on the Black Storm-Petrels. The contrast between the paleness of the wing-

bar and the blackness of the rest of the wing made this mark more prominent than on any of the Least, Black, or Leach's storm-petrel seen during the day. The rump was pure white, with the white extending down onto the sides of the vent, and the shape of the rump patch appeared as a shallow "U" opening toward the back. In addition, there was no dark dividing stripe in the center of the rump as on a Leach's Storm-Petrel.

Jon Atwood, G. Shumway Suffel, Richard E. Webster, and I submitted descriptions to the California Bird Records Committee. The Committee spent a long time scrutinizing this record, finally accepting it unanimously during the fourth circulation (Luther et al. 1983). In 1973 when the record was first reviewed, none of the Committee members was familiar with Band-rumped Storm-Petrels, and they were thus reluctant to rely on information found in the various sources of literature consulted. However, in 1980 when the record was circulated for the fourth time, much had been learned from observers, including some on the Committee who had seen this species at sea. It was verified at this time that the appearance, and particularly the mannerism of flight, of the bird seen off San Diego were characteristic of a Band-rumped Storm-Petrel.

IDENTIFICATION

Lee (1984) listed the features useful for identifying the Band-rumped Storm-Petrel at sea, comparing it with both the Leach's and Wilson's storm-petrels. He stated that the Band-rumped Storm-Petrel is most like a Leach's Storm-Petrel in size, coloration, and plumage pattern, both species having white rumps. He also stated that the Band-rumped Storm-Petrel is almost the same size as the Leach's Storm-Petrel, giving measurements that show it has slightly shorter wings and sketches that show it has a less noticeably forked tail. However, the tail on the Band-rumped Storm-Petrel appears to be square-ended much of the time. In addition the shapes of the two species' white rump patches differ. The white on the Band-rumped Storm-Petrel forms a uniformly wide shallow U-shaped band across the rump, extending onto the sides of the rump and vent. The shafts of the white rump feathers are white, but the tips of the longest rump feathers are black, giving a uniform banded appearance to the white rump. The white on the Leach's Storm-Petrel is divided down the center by a gray stripe, does not appear uniformly wide as on the Band-rumped Storm-Petrel, and only occasionally extends down onto the vent. The shafts of the white rump feathers are black. Lee also indicated that the Band-rumped Storm-Petrel is a darker bird than the Leach's Storm-Petrel, but this can vary in part according to the relative freshness of the plumage. Unfortunately most of these characters are difficult to evaluate at sea.

The Wilson's Storm-Petrel is noticeably smaller than the Band-rumped Storm-Petrel and has shorter, straighter, and more rounded wings. It also has a striking uniformly wide white rump patch that extends down onto the sides of the vent, as it does on the Band-rumped Storm-Petrel, but more extensively. The Wilson's Storm-Petrel has a rounded tail that could appear square-ended at times but never appears notched as on a Band-rumped Storm-Petrel. The feet of a Wilson's Storm-Petrel extend beyond the tip of

the tail, whereas those of a Band-rumped Storm-Petrel are never visible beyond the tip of the tail. In addition the webs between the toes on a Wilson's Storm-Petrel are yellow instead of black as on the Band-rumped Storm-Petrel.

The flight of the Band-rumped Storm-Petrel is noticeably different from that of the Leach's Storm-Petrel, and is now considered the most useful character for separating the two at sea. Unfortunately the authors of earlier field identification guides gave little information on how to separate the Band-rumped Storm-Petrel from the Leach's Storm-Petrel. Watson (1966) considered it nearly impossible to distinguish the two species by appearance, but indicated the flight may be the best at-sea character for this. He remarked, though, that this needed further verification. Peterson (1980) stated the Band-rumped Storm-Petrel is very similar to Leach's Storm-Petrel but has shorter wings and a less bounding flight. Brown (1980) was one of the first to describe the flight differences in detail, stating the Band-rumped Storm-Petrel flies with a faster and shallower wing-beat than does the Leach's storm-Petrel, that it moves in regular horizontal zigzags with no vertical bounding during flapping flight, and that it glides on wings held more or less flat. Harrison (1983) described the flight as usually buoyant, following a steady zigzag progression between quick wing-beats and low shearing glides, with wings held flat or bowed below the horizontal, producing a flight pattern recalling that of a small shearwater. Farrand (1983) also described the flight, stating the Band-rumped Storm-Petrel flies with wing-beats shallower than Leach's, gliding like a shearwater, and often following a horizontal zigzag course. Lee (1984) stated that while gliding the bird holds its wings parallel to the water surface with the outer primaries bowed below the rest of the wing as does Audubon's Shearwater (*Puffinus lherminieri*). Pratt et al. (1987) gave a little more information on the flight and confirmed the shearwater-like appearance.

DISTRIBUTIONAL SUMMARY

The Band-rumped Storm-Petrel ranges over the warmer waters of the Atlantic and Pacific oceans (Harrison 1983). In the western Pacific Ocean it is known to nest on Hidejima off the east coast of northern Honshu in Japan, may also nest on nearby Sanganijima, and breeds in small numbers on the Izu and the Bonin islands (Hasegawa 1984). It is a very rare in the waters around the Hawaiian Islands in the mid Pacific, though several fledglings have been found on Kauai in recent years (Harrison et al. 1984) and the species has been heard vocalizing in Haleakala Crater on Maui (Pyle 1984). In the eastern Pacific it is widely distributed through the Galapagos Islands where some 15,000 pairs nest (Coulter 1984). Crossin (in King 1974) indicated the Band-rumped Storm-Petrel has been seen as far north as 25°N in the eastern Pacific Ocean, showing two sightings from the vicinity of 25°N, 120°W, but Pitman (1986) plotted no positive sightings of the species north of 10°N, showing sightings north only to the vacinity of 10°N, 125°W. The bird sighted off San Diego on 12 September 1970 is, to date, the only accepted record from the Pacific coast of North America. Pyle, however, reported at least nine between 120 and 160 nautical miles off San Nicolas

Island in a restricted area of convergence between the California Current and the pelagic waters of the central Pacific in July 1989 (McCaskie 1989).

Even though this species occurs disjunctly in both the Atlantic and Pacific oceans, and breeding colonies in both oceans are widely separated, the various populations do not differ significantly in size or color. Therefore the subspecies once described are no longer recognized, the species being considered monotypic (Cramp and Simmons 1977).

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Accepted 31 July 1990

NOTES

LEUCISTIC BLACK-VENTED SHEARWATERS (*PUFFINUS OPISTHOMELAS*) IN SOUTHERN CALIFORNIA

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In his account of the biology of the Black-vented Shearwater (*Puffinus opisthomelas*), Everett (1988) mentioned that "leucism and partial albinism. . . are so far unrecorded for *opisthomelas*." Such plumage aberrations are widely recorded among birds, including, among procellariids, Sooty Shearwaters (*P. griseus;* Palmer 1962, Stallcup 1976) and a Greater Shearwater (*P. gravis*) off New England (Vickery 1978). Within the *Puffinus puffinis* complex, leucism has been documented for *P. p. mauretanicus* (Mackrill and Yesou 1988, Elkins 1990) and *P. p. puffinus* (Flumm 1990). This note presents photographic documentation of two leucistic Black-vented Shearwaters and briefly discusses implications for field identification of shearwaters. Leucism is used here in the sense of Buckley (1982) to signify a reduction or local absence of pigment short of albinism (the complete lack of pigment).

On 14 January 1984 Arthur L. Howe observed and photographed an odd shearwater from the vessel *Sharpshooter* in Santa Monica Bay, Los Angeles Co., California. Because the bird was with a large group of Black-vented Shearwaters and identical to them in size, shape, and style of flight, he tentatively identified the bird as a Black-vented Shearwater. The one photograph he obtained (Figure 1) confirms this identification.

In the field the bird showed diluted pigmentation on the head and neck, being essentially white-headed with a pale brown crown and pale brown and white mottling on the hindneck. The Black-vented Shearwater's crown color is normally "dark brown" (Palmer 1962, Harrison 1983). The white of the face, throat, and auricular area extended well back to the sides of the neck. The general dorsal plumage color was that of typical *P. opisthomelas*, though somewhat paler; the extent to which plumage wear might have contributed to the paler dorsum is uncertain. The undertail coverts appeared dusky, as is typical of this species. Another *opisthomelas* in similar plumage was observed in Santa Monica Bay in January 1988 (Howe pers. comm.).

On 7 March 1987 Jonathan K. Alderfer observed and photographed a Black-vented Shearwater in the San Pedro Channel, Los Angeles Co., with extensive white in the primaries, secondaries, uppertail coverts, undertail coverts, and hindneck (Figures 2-4). This individual also showed white mottling on the crown. Like the bird photographed by Howe, this bird was observed with normally plumaged Black-vented Shearwaters and was identical in size and shape (Figure 4). The extensive white in the wings was very evident in flight (Figures 2-3). An apparent *P. opisthomelas* showing large white wing patches was noted by Howe (pers. comm.) in Santa Monica Bay in November 1988; it was not photographed.

Leucism and other plumage anomalies in seabirds have obvious implications for field identification since species diagnosis at sea relies heavily on general plumage pattern and coloration (along with flight style and shape) rather than the details of structure and plumage. Leucism in Sooty Shearwaters has likely given rise to some claims

Figure 1. Leucistic Black-vented Shearwater in Santa Monica Bay, Los Angeles County, California, on 14 January 1984.

Photo by Arthur L. Howe

Figure 2. Boldly pied flight pattern of leucistic Black-vented Shearwater in San Pedro Channel, Los Angeles County, on 7 March 1987.

Photo by Jonathan K. Alderfer

Figure 3. Same leucistic Black-vented Shearwater in San Pedro Channel, Los Angeles County, 7 March 1987.

Photo by Jonathan K. Alderfer

Figure 4. Same leucistic Black-vented Shearwater on the water with typically plumaged conspecifics.

Photo by Jonathan K. Alderfer

of the Cape Petrel (*Daption capense*) in the northern Pacific Ocean (files of California Bird Records Committee)

The abnormal Black-vented Shearwater in Figure 1 bore a superficial resemblance in plumage to the Streaked Shearwater (*Calonectris leucomelas*), a vagrant to California waters with three records accepted by the California Bird Records Committee (Morlan 1985). However, the size, structure, and flight of the Santa Monica Bay bird convincingly rule out the much larger *Calonectris*, with its languid flight. Inexperienced observers all too often base field identifications on single field marks (Garrett 1986) while ignoring a suite of other characters that suggest a more sensible identification. In this case a largely whitish head might have suggested *C. leucomelas*. The bird photographed by Alderfer (Figures 2-4) showed a striking wing pattern suggesting that of a Cape Petrel and could conceivably have been mistaken for that species. Field identification problems within the *Puffinus puffinus* complex (including *opisthomelas*) are well-known (Everett 1988, Harrison 1983, Jehl 1982, Morlan 1985); observers should be award of the potential confusion generated by plumage aberrations.

I thank Arthur Howe and Jonathan Alderfer for documenting these records and bringing them to my attention and for permission to publish their photographs, W.T. Everett and R.R. Veit made a number of helpful suggestions after reviewing an early draft. A later draft benefited from review by W.R.P. Bourne and K.T. Briggs.

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Accepted 15 March 1990

FIRST RECORD OF THE GREAT KISKADEE IN BAJA CALIFORNIA, MEXICO

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The Great Kiskadee (*Pitangus sulphuratus*) has a widespread distribution extending from southern Texas south through most of Middle and South America to central Argentina (Meyer de Schauensee 1966). In western Mexico it is resident in southern Sonora with occasional individuals ranging north to southern Arizona (A.O.U. 1983). It has not been previously recorded from Baja California, Mexico (Wilbur 1987), even though its distinctive plumage and strident vocalizations make it an obvious and easily identified species throughout its range.

On 5 January 1987 we observed a single Great Kiskadee about 3 km south of San Jose del Cabo, Baja California Sur, in a date palm orchard intermixed with dry thorn scrub on the north shore of a permanent estero. Even though the bird was seen and heard only briefly before it disappeared, its distinctive plumage (yellow belly, brown back, rufous wings and tail, black crown and facial area with white throat, forehead and eyeline) and vocalizations, very familiar to all three observers, made us certain of the identification. The Great Kiskadee might be confused with the similar Social Flycatcher (*Myiozetetes similis*) and Boat-billed Flycatcher (*Megarhynchus pitangua*), which also occur in western mainland Mexico. However, the former species is substantially smaller than the bird observed, and Boat-billed Flycatchers lack the rufous wings and tail evident in this individual. Also, both of these species have distinctive vocalizations different from the Great Kiskadee's. Subsequent attempts over the next hour to relocate the bird were unsuccessful.

The avifauna of the Baja California peninsula has been summarized by Grinnell (1928) and more recently by Wilbur (1987). Even so, the difficulty of travel in some areas of this part of Mexico, particularly prior to the completion of the transpeninsular highway in 1973, has prevented the type of detailed field surveys necessary for a full description of the peninsula's avifauna. Many of the vagrants found regularly in southern California (Garrett and Dunn 1981) are yet unrecorded from the peninsula. While the occurrence of west Mexican species in Baja California is less probable, records of such species as the Fan-tailed Warbler (*Euthlypis lachrymosa*) (Grinnell and Lamb 1927) and Great Kiskadee certainly add to the allure of future field work in this area. The increased accessibility to this area (and increasing interest by ornithologists from both the U.S. and Mexico) is sure to result in new distributional records for Baja California.

We thank Dr. Juan Guzman P. of the Universidad Autonoma de Baja California Sur for his hospitality and logistical support and Eduardo Palacios C. for his company in the field.

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Accepted 19 July 1990

Great Kiskadee *Sketch by Tim Manolis*

FIRST RECORDS OF THE THICK-BILLED KINGBIRD IN BAJA CALIFORNIA, MEXICO

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On 13 December 1986 we found a Thick-billed Kingbird (*Tyrannus crassirostris*) in a dry wash dominated by paloverde (*Cercidium* sp.) and mesquite (*Prosopis* sp.), about 25 km south of La Paz, between the towns of San Pedro and El Triunfo, Baja California Sur, Mexico. The single individual was quietly perched most of the time it was under observation and only occasionally made short foraging flights. The diagnostic large black bill, dark forehead and "mask," contrasting clear white throat and breast, and notched tail were seen at close range by several observers (C.T. Collins, P.H. Collins, B.W. Massey, K. Keane, and C. Boardman). On 5 January 1987 presumably the same individual was again seen at this site by C.T. Collins, J.L. Atwood, P.H. Collins, and E. Palacios.

A second Thick-billed Kingbird was seen and heard by the same observers on 9 January 1987 on the grounds of the public zoo in the town of Santiago, approximately 50 km southeast of the previously described location.

The Thick-billed Kingbird breeds from southeastern Arizona and extreme southwestern New Mexico south in western Mexico to southern Puebla and western Oaxaca; it winters south to Chiapas and western Guatemala (A.O.U. 1983). It is migratory in the northern part of its range in Arizona and Sonora (Miller et al. 1957, Phillips et al. 1964). This species has not been previously recorded anywhere in peninsular Baja California (Grinnell 1928, Wilbur 1987).

In recent years there have been several records of Thick-billed Kingbirds in southern California during late fall and winter (Garrett and Dunn 1981, Unitt 1984), with one individual staying at one location throughout the winter and returning to the same locality for at least seven sequential years (McCaskie 1989). At least one of the birds we report similarly appeared to be sedentary during the December-January period and was apparently over-wintering at the site.

The Thick-billed Kingbird may be only a casual winter visitant to Baja California but the finding of two individuals during this rather brief period of field observation suggests that they may be of more regular occurrence. Despite the increased accessibility of many parts of the Baja California peninsula and increased numbers of observers, much additional field work is needed before the status of the Thick-billed Kingbird and many other species can be fully elucidated in this part of their range.

We thank Dr. Juan Guzman P. of the Universidad Autonoma de Baja California Sur for his hospitality and logistical support and Eduardo Palacios C. for his company in the field.

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Accepted 19 July 1990

A SPECIMEN OF CHUCK-WILL'S-WIDOW FROM HUMBOLDT COUNTY, CALIFORNIA

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A fresh specimen of a Chuck-will's-widow (*Caprimulgus carolinensis*) was found dead on a road near Loleta, Humboldt County, California, on 4 January 1989 by Jeff Apgar. This bird was erroneously reported by others in *American Birds* (43:363) as having been picked up by J. Agpan during the period 12–16 December 1988. The bird apparently had been hit by a car. It was delivered by Mr. Apgar to Hawkins, who donated it to the Humboldt State University, Department of Wildlife Museum. The specimen (H.S.U. 7749) has been mounted as part of the educational program at Humboldt State University. This is only the second record of this species in California and extends the range of the species far to the northwest of any previous record. The previous California specimen was reported in *American Birds* (41:140) and by S. F. Bailey (1989, W. Birds 20:93-95).

The Loleta bird is an immature male in fresh plumage. It weighed 110 grams when prepared on 24 January 1989. The wing chord measured 222 mm, the total length, 330 mm. Both testes were 2 mm long and 1 mm wide. The combination of large size, lack of white in the plumage, and lateral filaments at the base of the rictal bristles identify the specimen as a Chuck-will's-widow. The record has been accepted by the California Bird Records Committee (D. Roberson pers. comm.).

The bird had an empty gullet, but the gizzard was packed with brownish fibers and a few recognizable insect fragments, among them, the remains of two moths and one beetle. It also contained one seed of Bearberry (*Arctostaphylos uva-ursi*). Although the bird had no or little visceral fat and only a slight amount of subcutaneous fat around the base of the tail and over the small of the back, it was in good flesh, not emaciated, and its weight was only slightly smaller than the average for breeding birds as summarized by Bailey (1989).

Accepted 26 March 1990

THE CASPIAN TERN IN IDAHO

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Although it is a breeding species in many parts of the Great Basin (Ryser 1985) and along the Columbia River (Thompson and Tabor 1981), the Caspian Tern (*Sterna caspia*) has been infrequently recorded in Idaho. Burleigh (1972) listed it as a uncommon, local summer visitant to the southern part of the state with one record for northern Idaho at Lewiston, Nez Perce Co. He thought it might breed in Idaho, but knew of no colonies. Davis (1935), Levy (1950), and Oring (1962) recorded it in small numbers from Rupert (Minidoka Co.), south-central Idaho, and Camas National Wildlife Refuge (Jefferson Co.), respectively. Larrison et al. (1967) stated that it was known to breed only at the Dingle Marsh in Bear Lake Co. but gave no details. I present evidence here that this tern breeds at several locations in southern Idaho, is sometimes found in moderate concentrations in this part of the state, and is more than an accidental visitor to the northern part of the state.

Known breeding colonies stretch across the entire southern part of Idaho. In southwestern Idaho about 100 adults have produced 20 young a year from at least 1977 to 1989 in the Snake River islands section of the Deer Flat National Wildlife Refuge (pers, comm., refuge personnel). Sonnenberg and Powers (1977) considered it abundant here during summer, and the reported nesting in the spring of 1980 from a Snake River island near Nyssa, Oregon (Rogers 1980a), may have been by part of this population. In south-central Idaho Liven Peterson, in an unpublished survey of colonial birds for the Idaho Department of Fish and Game, found a colony of 20 nests at Magic Reservoir, Blaine Co., in the summer of 1972. He banded 29 young here. Charles Trost (unpubl. data) estimated 10-15 nests here in 1984 and found 16 fledglings on 18 July of that year. In July 1984 Trost (pers. comm.) found a colony of 15-20 pairs at Mormon Reservoir, Camas Co. In southeastern Idaho an unknown number nested in 1972 at North Lake Wildlife Management Area, Jefferson Co. (L. Peterson unpubl. data). A colony of 14 birds with young was found at Blackfoot Reservoir, Caribou Co., in the summer of 1982 (Rogers 1982), and was present at least the next 2 years with 10-15 pairs (C. Trost unpubl. data). A small colony of 5 to 10 pairs has nested at Bear Lake National Wildlife Refuge, Bear Lake Co., from at least 1980 to 1989 (G. Deutscher pers. comm.). Two to three pairs nested at American Falls Reservoir, Bingham and Power counties, in 1984 (C. Trost unpubl. data).

A review of quarterly reports from *American Birds* revealed an absence of any Caspian Tern records in Idaho during the 1960s and very early 1970s. This lack of records may reflect in part a paucity of active field workers in the state during this time, and Oring (1962) did find small numbers in Jefferson Co. Since the mid-1970s Caspian Terns have been reported consistently from southern Idaho. Larger concentrations include 14 at Rupert in the spring of 1976 (Rogers 1976) and 15 at Island Park Reservoir, Fremont Co., in the spring of 1978 (Rogers 1978). At Lake Lowell, Canyon Co., the Caspian Tern has been consistently recorded in small numbers with 14 in 1980 (Rogers 1980b) and 13 in 1987 (pers. obs.). I found 13 at C.J. Strike Dam in early September 1987. I have consistently found this species in late summer at American Falls Reservoir in the 1980s with a peak of 61 birds at the mouth of the Snake River in August 1986.

There was a record from west-central Idaho of one bird at Cascade Reservoir, Valley Co., in 1984 (Rogers 1984a). Northern Idaho records I know of are of two birds at Kootenai National Wildlife Refuge, Boundary Co., in 1983 (Rogers 1983a), four birds at Pend Oreille Lake, Bonner Co., in 1985 (Rogers 1985a), and nine records from the Lewiston area in the late 1970s and 1980s (Rogers 1983a,b,

1984a,b, 1985a,b, 1987, Weber 1981). Weber (1981) collected an adult female at Lewiston on 19 July 1978.

The discovery of six nesting colonies in southern Idaho and more frequent records in the last 15 years, including some of the fairly high numbers, indicate that the Caspian Tern may be increasing in the state. Since Burleigh lived for 11 years in the 1940s and 1950s at Lewiston and recorded only one Caspian Tern and there were no other northern Idaho records (Burleigh 1972), it certainly appears that this species has recently become more common in northern Idaho.

The only information on dispersal of Caspian Terns from Idaho is of one young bird banded at Magic Reservoir in the summer of 1972 recovered in April 1973 at Morelos Culiacan, Sinaloa, Mexico (L. Peterson unpubl. data).

I thank G. Deutscher, C. Trost, and the personnel of Deer Flat National Wildlife Refuge for providing information. This study was funded in part by the nongame program of the Idaho Department of Fish and Game.

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Accepted 20 May 1990

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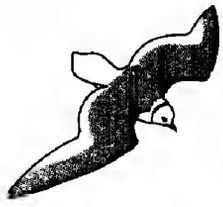

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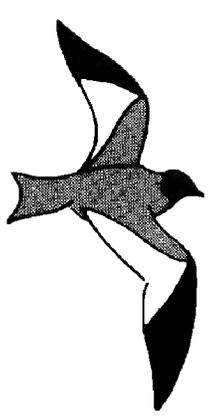

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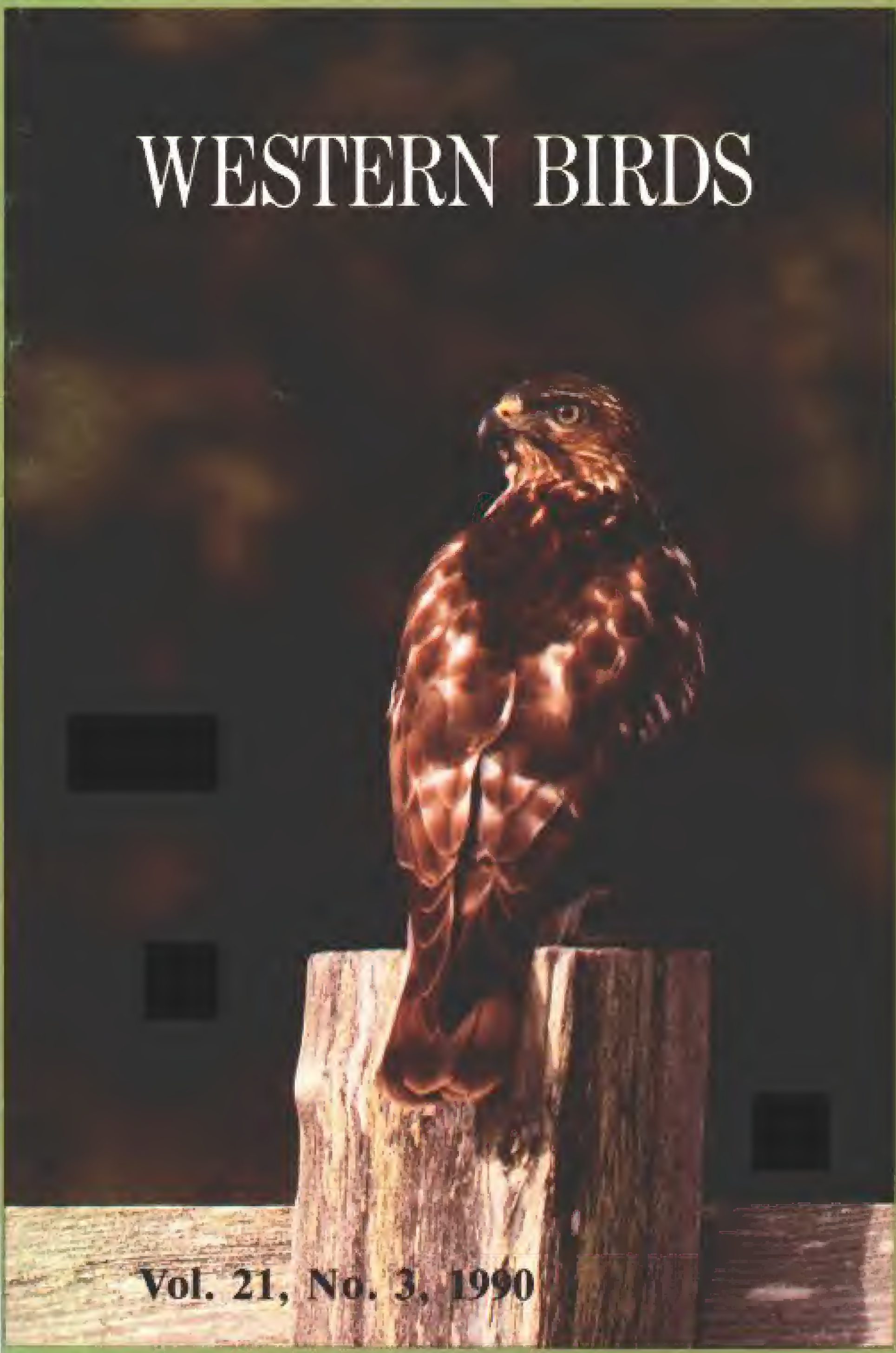

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WESTERN BIRDS

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Published January 30, 1991 ISSN 0045-3897

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Volume 21, Number 3, 1990

THE TAXONOMY, DISTRIBUTION, AND STATUS OF COASTAL CALIFORNIA CACTUS WRENS

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The southern coastal sage scrub is a distinctive plant community of southern California (Munz and Keck 1959, Mooney 1977). Beginning very narrowly in the Santa Barbara region, it is best developed in Ventura, Los Angeles, Orange, and San Diego counties, and ends in northwestern Baja California, where a different plant assemblage, the maritime desert scrub, begins (Thorne 1976). One very prominent feature of coastal sage scrub is thickets of cactus, including the Coastal Cholla, *Opuntia prolifera*, and two species of prickly-pears, *Opuntia littoralis* and *O. oricola*. The coastal sage scrub is the primary habitat of two birds, the California Gnatcatcher, *Polioptila californica californica*, and the San Diego Cactus Wren, *Campylorhynchus brunneicapillus sandiegensis*, that are declining rapidly because of loss of habitat to urbanization. (For explanation of variations in the spelling of the Cactus Wren's scientific name, see Appendix 1).

This paper has four goals. First, we present the characters distinguishing *C. b. sandiegensis* as a valid subspecies distinct from adjacent races of Baja California and the interior continental deserts. The characters are given in sufficient detail that anyone with a specimen in hand should be able to identify it. Second, we evaluate the taxonomic status of the Cactus Wrens occupying Ventura, Los Angeles, and Orange counties. In the original description (Rea 1986:119), these were referred to as less typical *sandiegensis*, and the birds from the San Fernando Valley, Los Angeles Co., were called *anthonyi* (Phillips 1986:120). Third, we analyze the habitat requirements of *C. b. sandiegensis*. And finally, we present census data from the last ten years demonstrating the rapid decline of the San Diego Cactus Wren due to habitat loss.

TAXONOMIC BACKGROUND

Taxonomists have long recognized that the Cactus Wren population isolated along the California coast is distinctive, but opinions differed as to

the significance of the difference (Table 1). Debate often focused on whether the wrens belonged to a continental or a peninsular subspecies. The peninsular forms in Baja California (*C. b. bryanti* and *C. b. affinis*, including "*C. b. purus*") have the entire tail black barred with white, except for the central brown pair of rectrices, have little or no buff wash on the flanks and abdomen, and have large spots rather uniformly distributed over the underparts. The black throat spots are mostly double on each feather. In contrast, the various continental forms have quite a different appearance. Their tails are essentially black except for the brown central pair. The black feathers have a subterminal white bar with additional white bars being restricted to the outer one or two pairs of rectrices. The birds have a strong cinnamon-buff wash on the abdomen and a cluster of large black spots on the throat. There is usually a single large spot along the shaft of each throat feather. The remaining underparts are more finely spotted.

The differences between the two groups of subspecies are readily apparent in the field as well as in the hand. Actually the two groups look like different species.

Furthermore, the two subspecies nearest the southern California coastal population differ strongly in dorsal coloration. *Campylorhynchus b. bryanti* of northern Baja (31°–29°N) is rather uniform dark umber brown above, whereas *C. b. anthonyi* of the deserts of southern California, adjacent northeast Baja California, southern Arizona, and northwestern Sonora has a brownish gray back that contrasts with the darker, strongly rufous crown and nape (see Figure 1 for distributions).

When A. W. Anthony (1894) erected the subspecies *C. b. bryanti* for the Cactus Wrens of northern Baja California (type locality San Telmo), he referred San Diego County birds to his new race. He wrote, "east of the Cuyamaca Mts., I am unable to find any indication of either *bryanti* or

Table 1 Historical Treatment of Coastal Cactus Wrens

Author	Date	Disposition
A. W. Anthony	1894	Race different from that in Baja or desert (unnamed)
E. A. Mearns	1902	*bryanti*
H. S. Swarth	1904	*couesi*
R. Ridgway	1904	*bryanti* (not typical) in San Diego region; *couesi* in Los Angeles region
F. Stephens	1904	*bryanti* "blending into *couesi* (or *anthonyi*)"
J. Grinnell	1915	"Meeting ground of *couesi* and *bryanti*" in same locality, possibly without intergradation
J. Grinnell	1921	*couesi* with slight tendency toward *bryanti*
G. Bancroft	1923	Distinct disjunct subspecies (unnamed)
J. Grinnell	1928	*couesi*
Grinnell and Miller	1944	*couesi*
G. Bancroft	1946	Western "group"
A. M. Rea	1986	Described subspecies *sandiegensis*
M. R. Browning	1990	Recognized *sandiegensis*

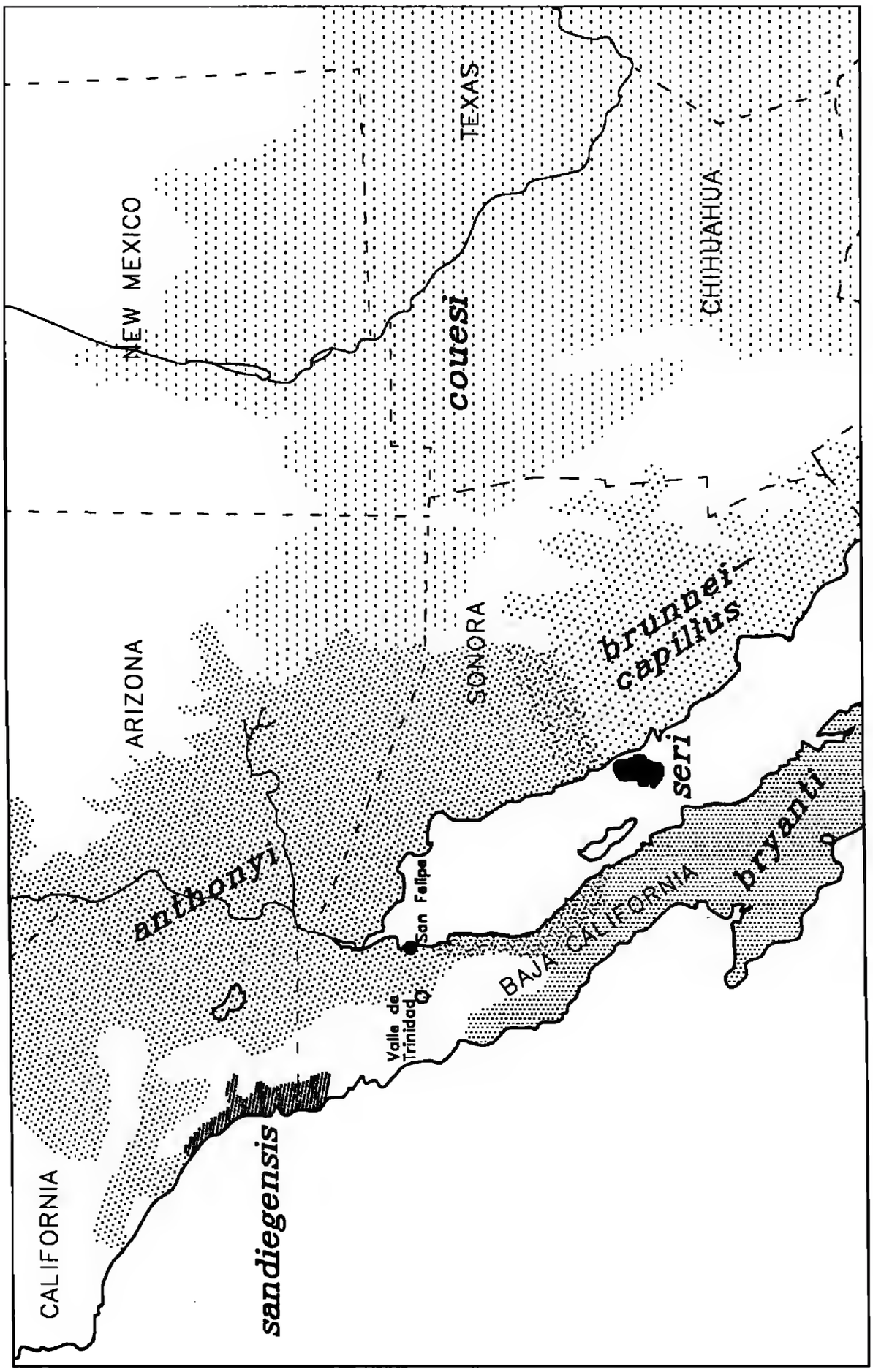


Figure 1. Distributions of subspecies of the Cactus Wren in the southwestern United States and northwestern Mexico. Overlapping of patterns suggests probable areas of intergradation.

affinis," noting that birds from the interior or desert portion of the county are unlike those of Baja California but the same as those from the rest of the Sonoran Desert of southern California, Arizona, and New Mexico. He also noted that the rufous wash of the underparts "is not so pronounced in western San Diego County skins as those from San Bernardino County (Cal.), Arizona, and New Mexico." In an addendum Anthony noted, "Owing to the lack of material, I am unable to make a satisfactory disposition of the Cactus Wren from north of the boundary. The series at hand points toward a race inhabiting the southwestern part of California, differing from the bird of Arizona, New Mexico, and Texas." Also in 1894, Anthony collected four specimens (now in the Carnegie Museum, Pittsburgh) from Valle de las Palmas and Carrizo Valley, a bit southeast of Tijuana in Baja California. These also show the San Diego combination of characters.

The Cactus Wren as a species had been described originally by Lafresnaye in 1835 from "Californie." Edgar A. Mearns (1902) attempted to determine where, in what was broadly conceived in the 1830s as constituting California, the original specimen might have been taken because, as Mearns explained, "the Cactus Wren of the portion of California west of the Coast Range Mountains is different from that of east." At his request, Robert Ridgway at the Smithsonian Institution examined the type specimen preserved at the Boston Society of Natural History. He concluded that it best matched material from Guaymas, Sonora, thus fixing this as the type locality. Mearns then described the subspecies *C. b. anthonyi* with type locality near Tacna, Yuma County, Arizona, and gave its range as "interior deserts of the southwestern United States, south into the Mexican states of Chihuahua, Sonora, and northeastern Lower California (east of the Coast Range)." He retained the population west of the Peninsular Ranges in *bryanti*.

Swarth (1904) took exception to Mearns' treatment, considering *C. b. anthonyi* and *C. b. bryanti* (at least as represented in southern California) both synonyms of *C. b. couesi* (type locality Laredo, lower Rio Grande, Texas). Swarth conceded that *bryanti* might be a valid race from the Baja California area Anthony ascribed to it. Swarth's inability to see more than one subspecies is hardly surprising because his specimens were all from the range of *anthonyi* as we define it here.

The same year Ridgway (1904) completed the third volume of his monumental Birds of North and Middle America. He treated *C. b. anthonyi* as a synonym of *C. b. couesi* of the lower Rio Grande, ranging west to Orange, Los Angeles, and *interior* San Diego counties, and included the "coast district of San Diego County" in the range of *C. b. bryanti* of northern Baja California.

Before the volume was issued, Ridgway received Swarth's publication and noted in an addendum (Ridgway 1904:753–754) that he agreed with Swarth in synonymizing *anthonyi* but not with Swarth's treatment of *bryanti*: "Mr. Swarth's California material apparently did not contain a specimen from the coast district (or any other portion?) of San Diego County, to which *H. b. bryanti* (not typical, however) is restricted in its California range." The third edition of the A.O.U. Check-list (1910) essentially followed Ridgway's (1904) treatment.

Frank Stephens (1904) likewise responded to Swarth's paper. Stephens gave an excellent analysis of the northwest continental and the two peninsular races. On the basis of a "hasty study" of A. W. Anthony's specimens, Stephens assigned two skins from San Diego to *bryanti*, noted the difference in crown color between the birds of coastal San Diego and the interior, but concluded there were "more *couesi* [or *anthonyi*, if distinct] south of the border than *bryanti* north of it." He did not specify whether he had desert or only coastal specimens in the series he was examining.

Initially, Joseph Grinnell (1915) believed that two forms of Cactus Wren occupied southwestern California. He listed *couesi* as "a common resident locally in the San Diegan district from San Diego northwest as far as Santa Paula, Ventura County." On the basis of the A. W. Anthony series as well as recently collected specimens in the Museum of Vertebrate Zoology, he listed *bryanti* as "sparingly and locally resident in the vicinity of San Diego. The metropolis of this form is to the southward, San Diego apparently being the meeting ground of *H. b. couesi* and *H. b. bryanti*, for the two are known to have nested in the same locality. These two forms thus have no wide area of intergradation, if actual blending occurs at all."

Grinnell (1921) later reexamined A. W. Anthony's specimens. He concluded that "specimens from San Diego County, California, which have been labeled '*bryanti*' prove to exhibit only a slight tendency in that direction, being much nearer *H. b. couesi*. Those individuals showing nearly or quite complete white barring of the tail do not show the other diagnostic features of *bryanti*, namely very heavy spotting below and dark upper surface."

Griffing Bancroft (1923) next pointed out that birds from the San Diego district are different from both *bryanti* and *couesi*, and he thought that they constituted a distinct subspecies. Furthermore, he noted the coastal birds were perfectly isolated except for perhaps through the narrow San Gorgonio Pass in Riverside and San Bernardino counties (see also Grinnell and Swarth 1913). He found only one place where the birds extended south of the international boundary, about 32 km east of Tijuana. Laurence M. Huey, curator of birds at the San Diego Natural History Museum, took specimens there, finding them "identical with the birds of southwestern California."

Bancroft (1923) surveyed the remaining area between the border and San Telmo (31°N) many times without finding the wren or its nests. The habitat was not suitable. Good cholla stands, Bancroft reported, "are confined to a narrow strip very near the ocean" where mesas drop off abruptly to the coast; inland there are but "small isolated patches" of habitat without wrens. Bancroft concluded from both field work and specimens that *C. b. bryanti* did not come closer than "150 miles" of California.

Grinnell (1928:211–212) mapped a "station of record" 32 km east of Tijuana as *C. b. couesi*. On the basis of specimens, he also concluded that this race occurs from northeastern Baja California south along the gulf coast to a little below 31°N. Grinnell's map shows a wide hiatus in the Cactus Wren's distribution between the San Diego–Tijuana region and the San Telmo region at 31°N, a north–south distance of 160 km.

The fourth and fifth editions of the A.O.U. Check-list (1931, 1957) likewise considered the Cactus Wrens of all of southern California to be *C. b. couesi* with *bryanti* restricted to Baja, coming north only to 31°N.

Bancroft (1946) believed birds of coastal southern California to have the darkest eggs of any of the peninsular or continental forms he studied, further exemplifying, he said, the distinctiveness of this isolated population. On the basis of larger sample sizes now available, this apparent difference in egg color does not stand up (Lloyd Kiff pers. comm.).

After examining specimens in major U.S. museums, Rea prefers to recognize *couesi* and *anthonyi* as distinct. *C. b. anthonyi* has a more rufescent crown and a paler, grayer ground color of the back, whereas *couesi* has a darker brown crown and a darker, warmer brown back. *C. b. couesi* occupies Texas, southern New Mexico, and adjacent Mexico, with some individuals scattered across the higher elevations of the species' range in central Arizona (Rea 1983). Phillips (1986) reluctantly recognized *anthonyi* and synonymized *couesi* with a query in *C. b. guttatus* (Gould) of central Mexico. Kenneth C. Parkes (pers. comm.) notes that "*guttatus* is distinctly shorter-tailed, has the interscapular area less grayish, and has larger and rounder spots on the flanks" than Texas specimens and suggests that *couesi* and nominate *brunneicapillus* may be indistinguishable.

While preparing a revision of the Cactus Wrens of southern Arizona (Rea 1983:206), Rea noted and set aside various specimens in the San Diego Natural History Museum collection labeled as "*couesi*" but having anomalous characters. Generally their spotting below was too heavy and they had too much white in the tail for either *couesi* or *anthonyi*, but their backs were not as dark as *bryanti*. When their localities were checked, all proved to be of coastal origin. Later this population was described as the subspecies *C. b. sandiegensis* Rea, 1986 (type locality San Diego Wild Animal Park, 3.7 km west of San Pasqual, adjacent to San Pasqual Battlefield State Park, San Diego Co., California).

CHARACTER ANALYSIS

Methods

We examined specimens from the following collections: San Diego Natural History Museum (SD), Pomona College (PC), Los Angeles County Museum (LA), University of California, Los Angeles (UCLA), University of California, Santa Barbara (UCSB), Museum of Vertebrate Zoology, Berkeley (MVZ), University of Arizona, Tucson (ARIZ), University of New Mexico, Albuquerque (UNM), National Museum of Natural History, Washington, D.C. (US), Carnegie Museum, Pittsburgh (CM), and American Museum of Natural History, New York (AMNH).

We believe that we have located virtually all extant adult specimens from coastal populations (46 from the San Diego vicinity and 67 from the northern coastal region). No specimens known to us exist from northern San Diego County or most of Orange County (see Figure 2).

Cactus Wrens are exposed to bright sunlight much of the day. As a result, their plumage undergoes significant seasonal color change due to fading

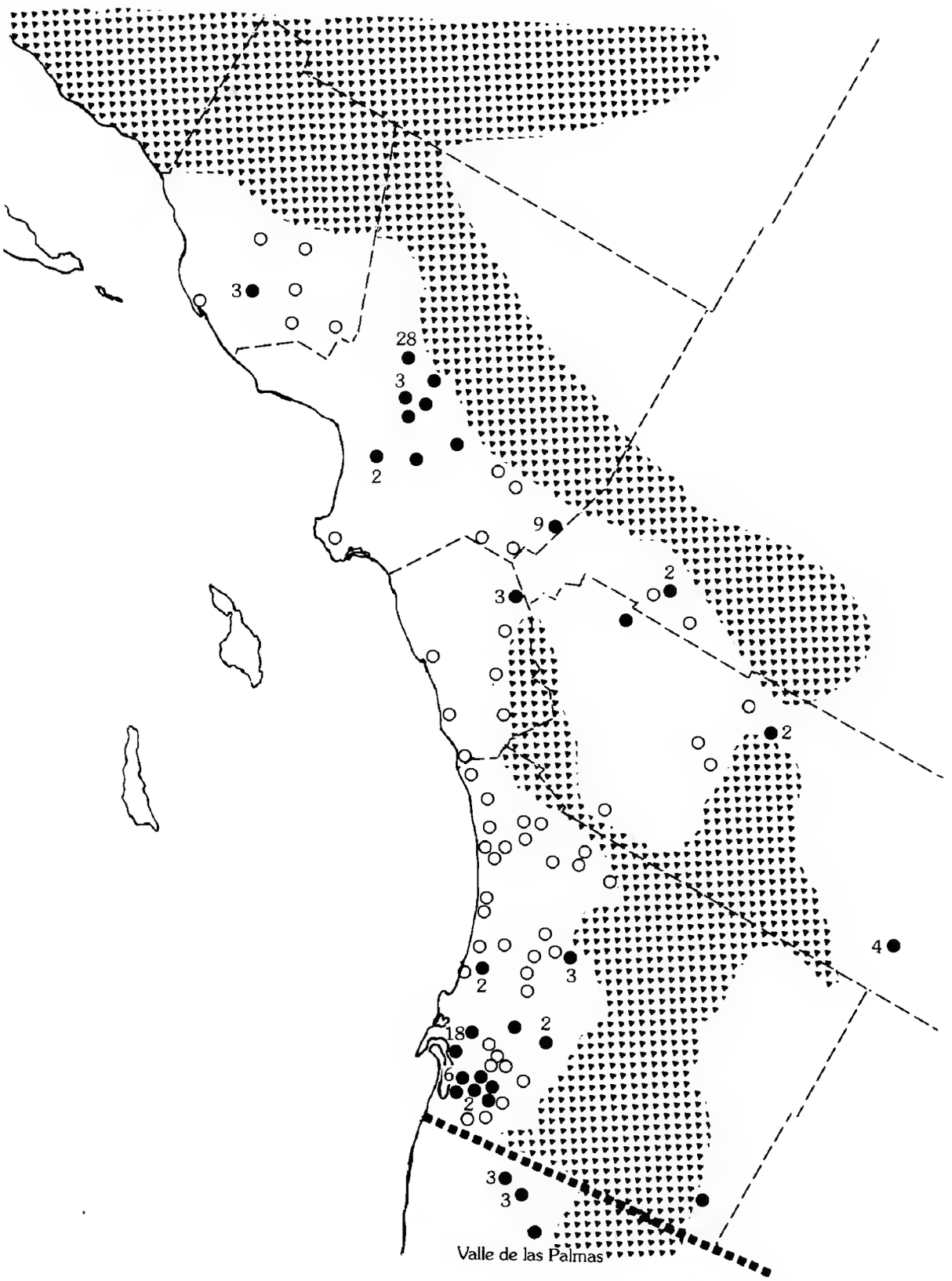


Figure 2. Distribution of the Cactus Wren in coastal southern California and northwestern Baja California. Dots, localities from which adult specimens were examined; numbers, number of adult specimens examined from that locality (if more than one); circles, additional localities from which the Cactus Wren has been reported or collected (some localities in close proximity have been lumped; see Figure 13 for more detail).

and wear. November-taken specimens, for example, are not comparable to January specimens, nor are these comparable with March skins. Insofar as possible, we made color comparisons only among specimens taken within six weeks of each others' collection date. Post-mortem color changes (foxing) also occur in this species. Dorsal browns become more rufescent within the first decade the specimen is in the museum.

Comparisons were made with 94 specimens from the peninsula (races *C. b. bryanti* and *C. b. affinis*) and approximately 300 specimens from the continent (*C. b. anthonyi*, *C. b. couesi*, *C. b. brunneicapillus*, and *C. b. guttatus*).

Scoring of Characters

Seven characters (Table 2, Figures 3 and 4) distinguish the continental desert populations of Cactus Wrens, the races *C. b. anthonyi* and *C. b. couesi*, from the Baja California peninsular races *C. b. bryanti* and *C. b. affinis*.

1. Chin/gular area. The chin and interramal area are immaculate in over three-quarters of the specimens from the continental deserts. An occasional specimen from the western or Colorado desert lacks this white patch, having spots going as far forward as in peninsular wrens. Peninsular specimens are spotted on the chin all the way through to the interramal area.

Table 2 Characters Distinguishing Subspecies of the Cactus Wren[a]

Character	*C. b. anthonyi*	*C. b. bryanti*
1. Chin/gular area	Broadly white in >75% (1)	Speckled (2)
2. Chest spot shape	Always single, large central reniform spot (1)	Mostly double, irregular marks (2)
3. Abdominal spotting	Fine, linear to narrowly rhomboid, contrasting with throat/chest (1)	Heavy, oval to diamond-shaped, not strongly contrasted to chest (2)
4. Chest patch	Spots aggregated to form black patch (1)	No strong aggregation into patch (2)
5. Flank/abdomen color	Conspicuous buffy wash across flanks and lower abdomen (1)	Largely white, weak ochre wash ± restricted to flanks or absent (2)
6. Back color	Warm ground color of nape contrasting with grayer interscapulars and lower back (1)	Warm ground color of nape continuing through interscapulars and lower back without demarcation (2)
7. Tail barring	Largely black (states 1–3, see Table 3)	Largely white-barred (states 7–9)

[a]Score values in parentheses

2. Chest spot shape. Chest spots of continental desert birds are single, occupying the middle of the feather, and centered on the shaft (Figure 5a). An occasional individual has some split spots along the lateral margins of the chest. The spots' shape is variable but is most often kidney- or even

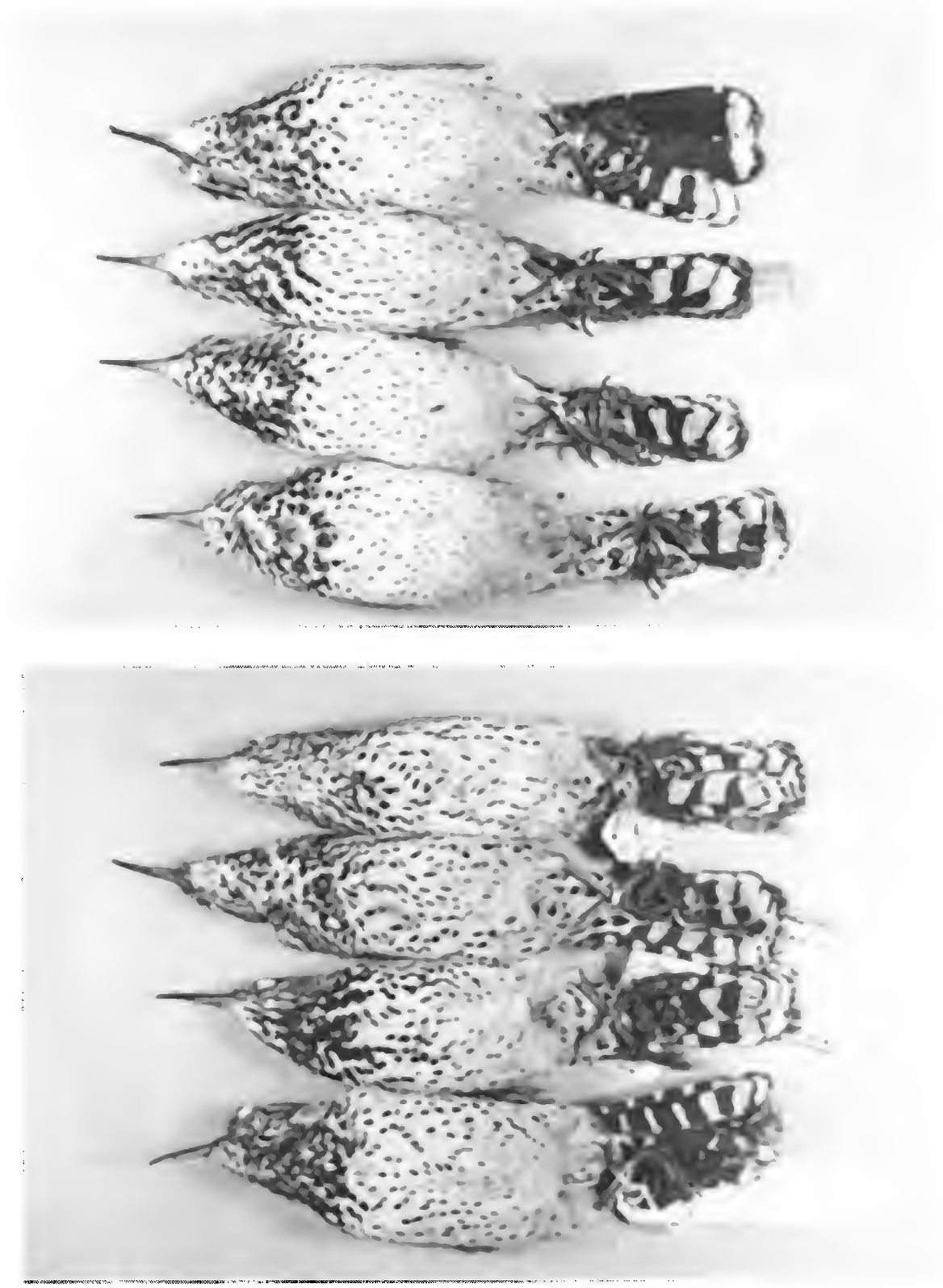


Figure 3. Underparts of two subspecies of the Cactus Wren. Upper, *C. b. anthonyi*; lower, *C. b. sandiegensis*.

chevron-shaped, with the proximal margin concave. In both peninsular subspecies the central part of the chest feather is white, and irregularly shaped spots occupy the two distal lateral corners of the feather (Figure 5b).

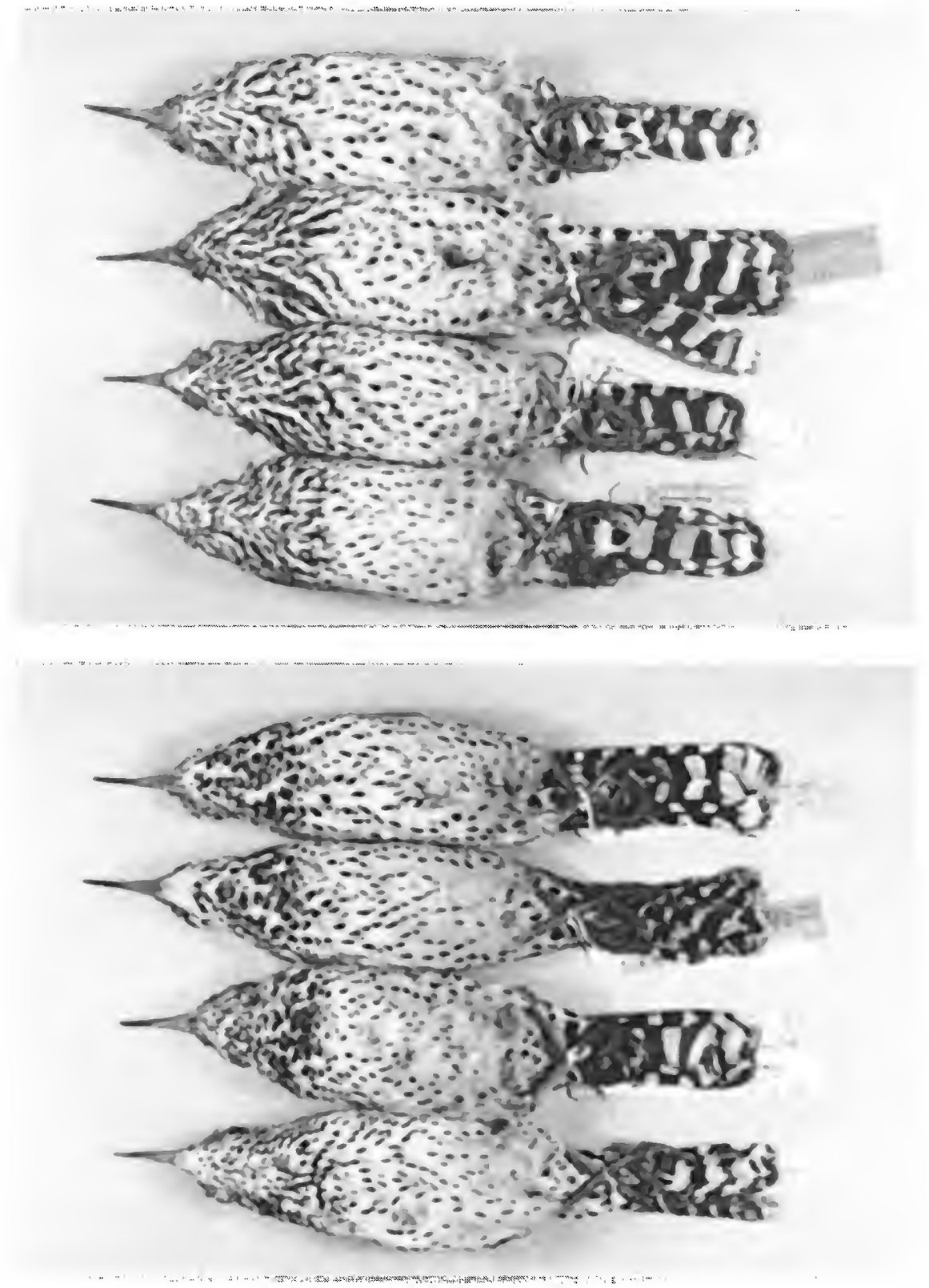


Figure 4. Underparts of two subspecies of the Cactus Wren. Upper, *C. b. bryanti*; lower, *C. b. sandiegensis*.

3. Abdominal spotting. In continental Cactus Wrens the flanks and belly are largely pale because the spots of this region are fine, either linear or rhomboid, strongly contrasting with the large single spots on the chest. In peninsular forms the abdominal spots are large and oval, giving the appearance of a bird with an almost uniformly marked undersurface. Spots on the crissum of *bryanti* are two or more times larger than those of *anthonyi*.

4. Chest patch. Because of the larger size of the chest spots of continental birds as well as the contrasting fineness of the spotting on the rest of the underparts, there is a conspicuous aggregation of the spots into a black chest patch. This is only weakly correlated with sex. In some cases a male may be more densely spotted than a female, but most anatomically sexed specimens cannot be segregated on this criterion. Peninsular Cactus Wrens are more uniformly marked below, with nonaggregated (double) chest spots and large oval abdominal spots. In other words, a chest patch is lacking.

5. Flank/abdomen color. Until their plumage is worn and faded, continental Cactus Wrens have a strong buffy wash across the flanks and abdomen, contrasting with the white ground color of the remaining underparts. In peninsular birds this wash is usually entirely absent. Some individuals have a weak wash, but the color is more yellowish, nearest Pale Ochraceous Buff of Ridgway (1912). Both the quality and the quantity of the color differ. An occasional peninsular specimen has a distinct wash below, but this invades the entire underparts to the chest. This color may be adventitious, the result of a bird dust-bathing in red (iron-oxide) clay soils.

6. Back color. In *anthonyi*, the ground color of the back is brownish gray, distinctly contrasting with the rufous of the crown and nape. The crowns of peninsular birds are even more strongly rufescent, with the warmer, darker brown tones extending down through the ground color of the entire dorsum. (The shape of the white dorsal streaks, bordered by fuscous or blackish streaks, appears not to vary geographically, at least in the northwestern Mexico and the southwestern U.S.)

7. Tail markings. Continental forms of adult Cactus Wrens have essentially black tails except for the brown central pair of rectrices and the white subterminal bar across the remainder (Table 3). White bars and spots are restricted primarily to the outer (sixth) rectrix. Rectrix 5 may have a trace of white or a distinct spot or bar on the inner web (states 1–3 in Figure 6). Peninsular forms have distinct white bars and spots on the inner webs of rectrices 3–6, their tails thus being completely barred.

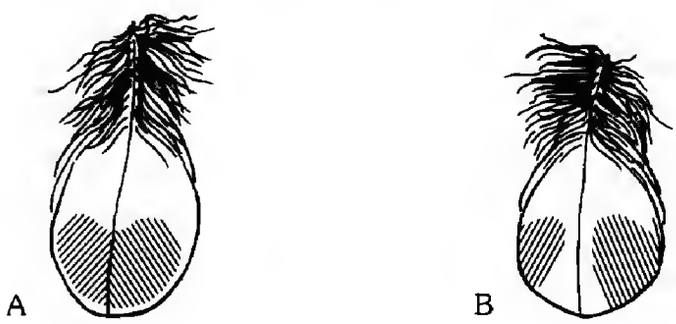


Figure 5. Chest-spot shapes in two groups of subspecies of the Cactus Wren. A, continental subspecies; B, peninsular subspecies.

The pattern in juvenal rectrices differs from that in adults in that the distal white marking is not a simple subterminal bar running across the tail. Usually there is a terminal spot at the rachis running back onto the inner vane as an irregularly shaped bar, which may or may not be actually connected to the spot (Figure 7). This produces tails more extensively marked with white in juveniles than in adults from the same populations. Juvenal rectrices are also more rounded and less truncated at their tips. Occasional first-winter birds fail to molt their rectrices. In the analysis of these individuals, we have considered the distal spot and bar or splotch to be one rather than two separate markings. Specimens in juvenal plumage proved so variable in most other characters that we did not attempt to score them, except where noted specifically in the text.

Each adult specimen examined was scored for the seven character states (Table 2). Characters 1 through 6 were scored 1.0 for the state normally found in the western continental desert form (*C. b. anthonyi*) and 2.0 for the state normally found in the northern peninsular form (*C. b. bryanti*). Conditions intermediate between these were scored 1.5. Tails were scored 1–3 for states normally found in *anthonyi*, 4–6 for intermediate states, and 7–9 for states found in *bryanti*. Tails with conditions intermediate between the states given in Table 3 and Figure 6 were encountered. Some characters readily admit intermediate states (tail pattern, as noted, and abdominal color); others, such as chest spotting, are either/or.

Not every available specimen could be scored for all seven distinguishing characters. Some fall individuals were still molting their rectrices when collected. Others had missing or broken tail feathers. (Loose rectrices should be attached to the specimen or its label, as they are critical in the evaluation of coastal birds.) A frequent problem we encountered with Los Angeles area specimens was evaluating colors. Because of considerable

Table 3 Tail Patterns of Cactus Wrens[a]

State	Rectrix 5	Rectrix 4	Rectrix 3
States normally found on wrens from continental deserts[b]			
1	No white	No white	No white
2	Trace white	No white	No white
3	White spot (distinct)	No white	No white
States normally found on wrens from coastal sage scrub, San Diego region			
4	Several distinct spots	Trace or none	Trace or none
5	Spots and bar(s)	Spots and bar(s)	Trace
6	Distinct white bars	Spots and bars	Spots
States normally found on wrens from peninsular Baja California			
7	Distinct white bars	Distinct white bars	Spots
8	Distinct white bars	Distinct white bars	Spots and bars
9	----------Entire tail barred (except central pair)----------		

[a]Inner webs, exclusive of white subterminal bar
[b]States 1–3 may have reduced white even on rectrix 6

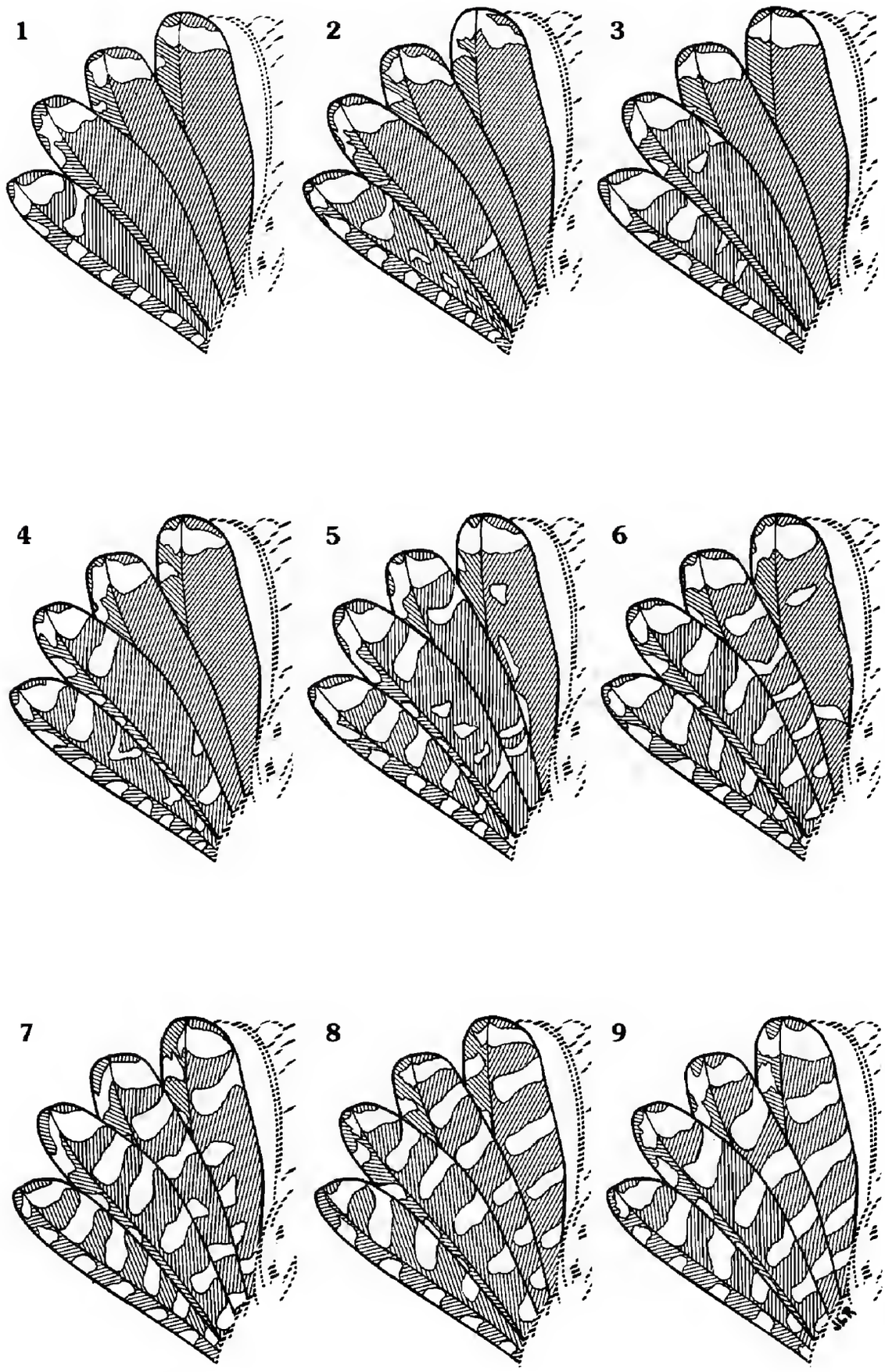


Figure 6. Variations in tail patterns of adult Cactus Wrens. Outer (6th) rectrix at left in each set. Character states correspond to descriptions in Table 3. States 1–3, continental deserts; 4–6, southern coastal sage scrub, San Diego area; 7–9, peninsular Baja California.

soot staining, character 5 (the extent and color of the abdominal wash) was particularly difficult to access. Even early fall specimens of this region scarcely a month after molt were already severely blackened.

The following formula was used to calculate an index for each character for each population:

$$\frac{\text{Character value} \times \text{number of individuals with that character}}{\text{Total number of scored specimens}} = \text{Index}$$

For example, from the northern coastal or Los Angeles population, 65 of the 67 specimens could be scored for chin spotting (character 1). Of these, 52 had distinctly white chins (value 1), 12 had some spotting encroaching into the chin (value 1.5), and one had the interramal area fully spotted (value 2).

$$\begin{array}{r} 1 \times 52 = 52 \\ 1.5 \times 12 = 18 \\ 2 \times 1 = 22 \\ \hline 72 \end{array}$$

$$\frac{72}{65} = 1.11$$

The index shows the average value for the entire sample scored but does not show the range of variability within the population.

Pooled Characters of Two Populations

Of the 46 adult specimens of the Cactus Wren known from coastal San Diego County and northwestern Baja California, 315 individual characters could be scored out of a possible 322 (46 × 7; there were seven missing

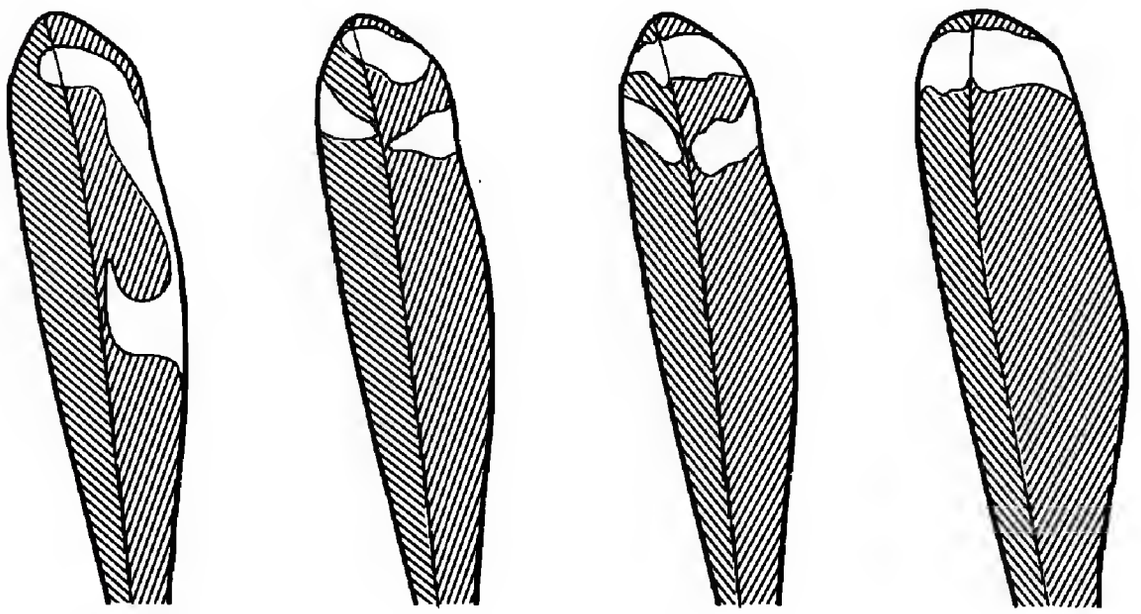


Figure 7. Variations in tail patterns of juvenile Cactus Wrens, showing the "single" subterminal bar. Right feather is of an adult for comparison.

character scores). The pooled results (Table 4) are plotted in Figure 8. Total scores for five characters (1, 3, 4, 5, and 7) are at or near the mean between pure *anthonyi* (1.0) and pure *bryanti* (2.0). In two characters (2, type of chest spot; 6, back color), San Diego birds scored nearer *anthonyi*.

Of the 67 available adult specimens of the Cactus Wren from the Los Angeles region (Ventura, Los Angeles, and extreme northern Orange counties), 429 individual characters could be scored (there were 40 missing character scores). The pooled results (Table 4) are plotted in Figure 9. In only two characters (5, reduction of buff on abdomen; 7, increase in white tail markings) was there an approach toward peninsular birds.

Three specimens (MVZ) from Santa Ana Canyon in northern Orange County are indistinguishable from transmontane *anthonyi* in characters 1 through 6. Their tails score 4.5, 3, and 6, indicating a very slight tendency toward the peninsular subspecies.

The San Diego-Area Population

In making subspecific identifications, however, taxonomists need to be able to identify *individual specimens*; averages or pooled characters are not sufficient. The standard frequently used for evaluating a subspecies is the so-called seventy-five percent rule (Amadon 1949). In its more rigorous interpretation, "before a population is given subspecific status, at least 75

Table 4 Pooled Characters of Coastal Cactus Wrens

Character	Sample Size	Index[a]
San Diego-vicinity population		
1. Chin/gular area	45	1.34
2. Chest spot shape	44	1.26
3. Abdominal spotting	46	1.49
4. Chest patch	46	1.50
5. Flank/abdomen color	46	1.46
6. Back color	43	1.22
7. Tail barring	45	5.18
Northern coastal population		
1. Chin/gular area	65	1.11
2. Chest spot shape	64	1.00
3. Abdominal spotting	67	1.06
4. Chest patch	65	1.03
5. Flank/abdomen color	55	1.22
6. Back color	59	1.03
7. Tail barring	54	3.44

[a]For characters 1–6, a value of 1.0 indicates the condition typical of *C. b. anthonyi*; a value of 2.0 indicates the condition typical of *C. b. bryanti*. For character 7, a value of 1.0 indicates the least barring, a condition found only in *C. b. anthonyi*; a value of 9.0 indicates the most barring, a condition found only in *C. b. bryanti* and *C. b. affinis*.

percent of the individuals [constituting] it must be separable from 99+ percent of the individuals of all other populations of the same species which may overlap with it as regards the geographically variable characters. An equivalent statement is that 97 percent of one of two compared populations must be separable from 97 percent of the other."

As noted above, at least seven characters or variables distinguish southwestern Cactus Wrens. For the two coastal segments, the Los Angeles and San Diego regions, we determined how many characters distinguished an *individual* specimen from adjacent subspecies—in other words, how many of the available specimens were distinguishable from *anthonyi* on the basis of no character, only one character, only two characters, etc., to all seven variables (Figures 10a and 11a). The same comparison was made with *bryanti* (Figures 10b and 11b). Of 46 known specimens from coastal San Diego County and adjacent Baja California, that is, of *sandiegensis* as we here define it, all are distinguishable from *anthonyi* by at least one character, while 86.9% (40 individuals) are distinguishable from it by three or more

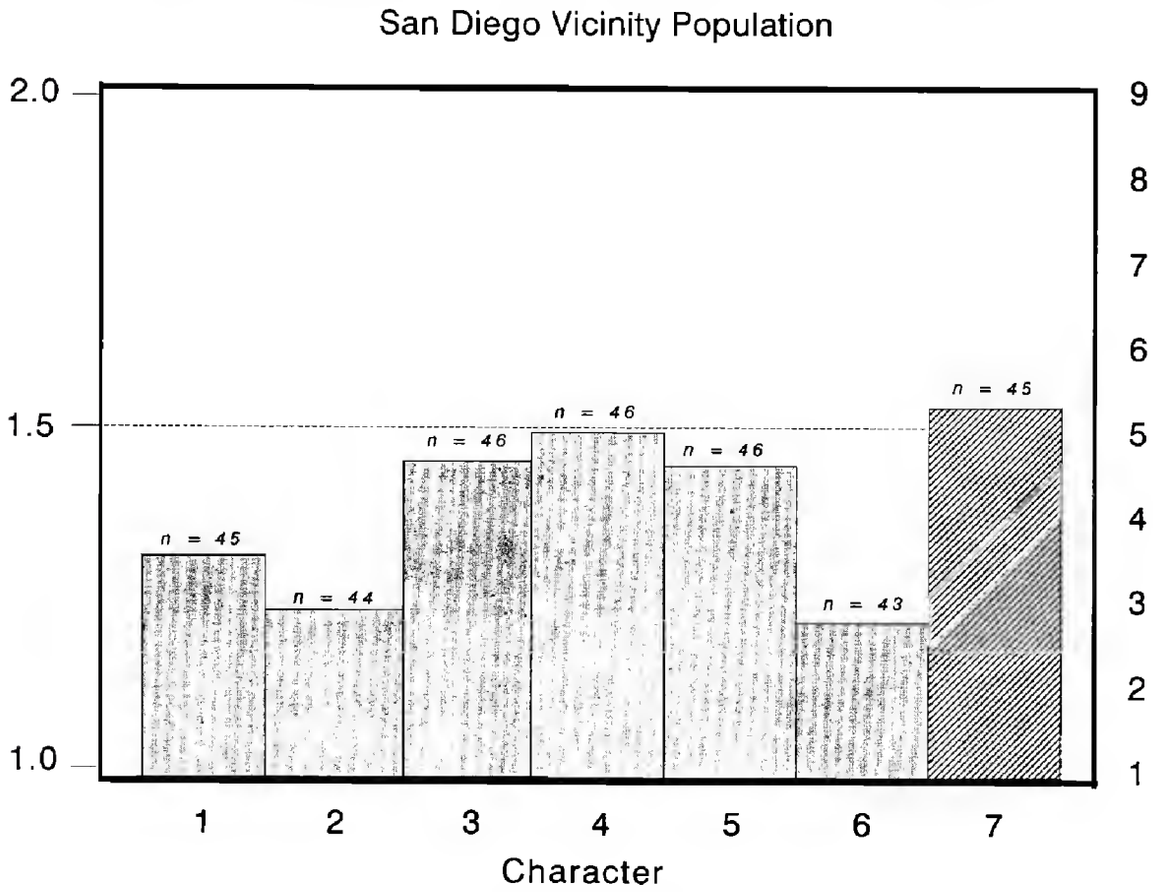


Figure 8. Pooled characters of the San Diego-area population of the Cactus Wren (*C. b. sandiegensis*) (see Tables 2 and 4). Characters 1–6 go with the left vertical axis. Character 7, tail barring (cross-hatched), goes with the right vertical axis. Low scores (near 1) indicate continental values (*anthonyi* and *couesi*), while high scores (near 2 or, for tails, near 9) indicate peninsular values (*bryanti* and *affinis*). Height of bar represents the mean score for all specimens of the population scored for that particular character; *n*, number of individuals scored.

The San Diego population is strongly intermediate for characters 3, 4, 5, and 7 (see text), less strongly intermediate for characters 1, 2, and 6.

characters. By the same comparison to *bryanti*, the northern peninsular form, 97.8% of *sandiegensis* (45 individuals) are separable on the basis of three or more characters. Even more rigorously, 89.1% (41 individuals) are distinguishable from peninsular birds by four or more characters. No specimen from the range of *sandiegensis* was indistinguishable from *bryanti*, nor was any distinguishable on the basis of only a single variable. As noted by the white bars in Figure 11b, two specimens, one each falling into the two- and three-character-only categories, were defective and could not be scored for all possible characters.

The population named *sandiegensis* thus meets the criterion of a valid subspecies. Based on a mosaic of characters, it is completely distinguishable from disjunct populations to the east (*anthonyi*) and the south (*bryanti*). If we could present a seven-dimensional figure, we could demonstrate this 100% separation graphically. Two variables are the most that can be shown easily in a scatter diagram. The two that allow the most discrimination,

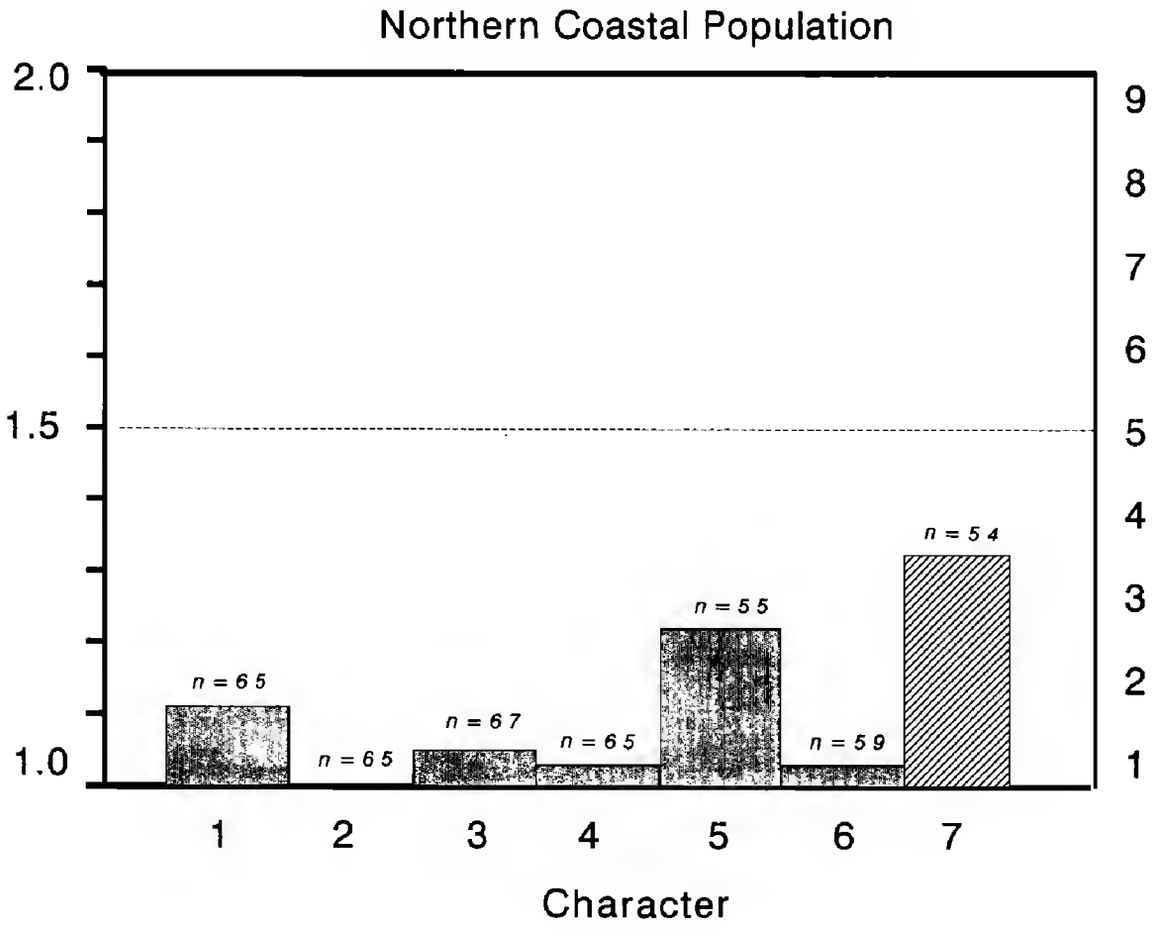


Figure 9. Pooled characters of the Los Angeles-area population of the Cactus Wren (see Tables 2 and 4). Characters 1–6 go with the left vertical axis. Character 7, tail barring (cross-hatched), goes with the right vertical axis. Low scores (near 1) indicate continental values (*anthonyi* and *couesi*), while high scores (near 2 or, for tails, near 9) indicate peninsular values (*bryanti* and *affinis*). Height of bar represents the mean score for all specimens of the population scored for that particular character; *n*, number of individuals scored.

The northern coastal population is very near the desert (continental) *anthonyi* but shows some peninsular genetic influence in characters 1, 5, and 7.

abdominal spotting and tail barring, together distinguish 89% of *sandiegensis* from 86% of *anthonyi* from the lower Colorado River valley (Figure 12). While it is not possible to predict in individual specimens which characters will distinguish *sandiegensis*, there is a greater probability that these will be chest patch (3), abdominal spotting (4), abdominal color (5), or tail pattern (7). Because of the aggregate nature of the characters, all possible characters should be considered in identifying an individual to subspecies (see Amadon 1949:254–255). A single character, even among the four most likely (3, 4, 5, 7), may not be distinguishing.

At least in historic times, the San Diego Cactus Wren has been isolated from conspecific populations to the south by a hiatus of about 160 km owing to a lack of suitable habitat. This population extends no farther south than does the coastal sage scrub habitat. There may be a few pairs scattered throughout the hiatus, but it is doubtful that any sizable colonies exist here. To the east, the coastal subspecies is broadly separated from desert *anthonyi* by unsuitable habitat (the chaparral, oak woodland, and coniferous forests of the Peninsular Ranges). The desert subspecies reaches

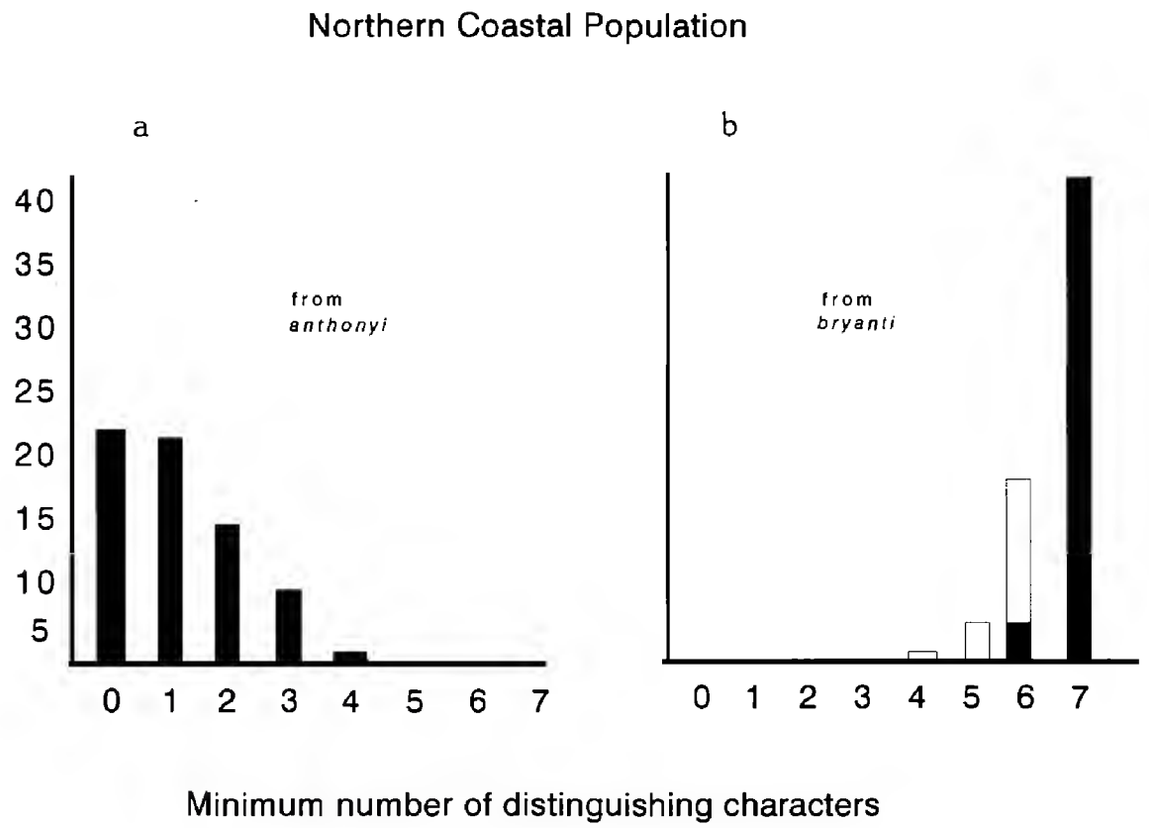


Figure 10. Number of characters (horizontal axis) distinguishing the San Diego-area population of the Cactus Wren (*C. b. sandiegensis*) from desert *anthonyi* (left) and peninsular *bryanti* (right). (Number of individuals on vertical axis.) Black bars, specimens scored for all possible character states; white bars, defective specimens lacking scores for one or more character states.

All but six specimens from the San Diego area were distinguishable from desert *anthonyi* on the basis of three or more characters, while all but two were distinguishable from peninsular *bryanti* on the basis of three or more characters (four specimens could not be scored for all characters).

eastern San Diego County, ascending east-facing slopes to an elevation of at least 1190 m (SD 42688).

The Los Angeles-Area Population

Results for coastal Cactus Wrens north of San Diego County are graphed in Figure 11. Only 10.9% (seven individuals) are distinguishable from continental forms by three or more characters. (The highest-scoring specimen, SD 45699, is one of the only three available from Ventura County, the northernmost locality.) Of 67 specimens, 22 (32.8%) are completely indistinguishable from *anthonyi*. Peninsular characters are only weakly reflected in northern coastal birds. All 67 specimens are distinguishable from *bryanti* on the basis of four or more characters. Even here, the lower limits may be artifacts, since the three specimens falling into the four- or five-character-only categories and 15 of the 19 falling in the six-only category were defective (that is, could not be scored for all seven characters). Of 67 scored specimens, at least 45 (67.2%) were distinguishable from the peninsular populations by all seven characters. Thus, while the northern

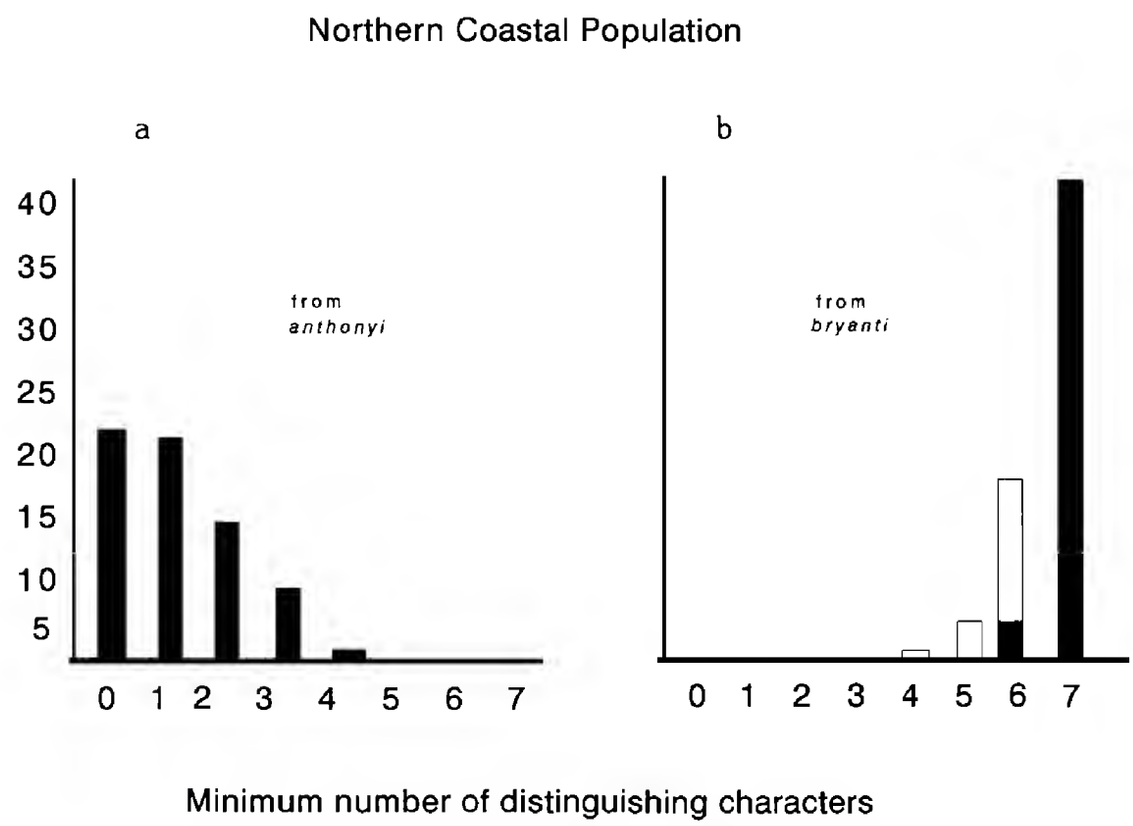


Figure 11. Number of characters (horizontal axis) distinguishing the Los Angeles-area population of the Cactus Wren from desert *anthonyi* (left) and peninsular *bryanti* (right). (Number of individuals on vertical axis.) Black bars, specimens scored for all possible character states; white bars, defective specimens lacking scores for one or more character states.

Only five Los Angeles-area specimens were distinguishable from *anthonyi* on the basis of three or more characters, while 43 specimens were distinguishable from *bryanti* on the basis of six or seven characters (18 specimens could not be scored for all characters).

coastal Cactus Wrens are readily distinguishable from *bryanti*, they are not taxonomically separable from adjacent desert *anthonyi*. The Los Angeles-area population tends only slightly toward *sandiegensis*, mostly in tail pattern, more weakly in reduced abdominal buff and invasion of chin spotting into gular region.

As an isolated character, how reliable is tail pattern? Our initial criterion, based on a somewhat superficial examination of several hundred specimens, was that continental birds had largely black rectrices except for the subterminal white bar and outer (6th) rectrix, while peninsular birds had completely barred or spotted rectrices (this is exclusive of the brown central pair in all populations). Baja California specimens indeed cluster in categories 8 and 9, with few scoring as low as 7. To evaluate the range of variation in continental birds, we scored 35 specimens from the Tucson region, eastern Pima Co., Arizona, well outside the influence of *bryanti*. Here, 77% of the tails ranked, as expected categories 1 to 3.5, with a mean of 2.9. However, seven specimens scored 4, and one scored 4.5. Thus the somewhat higher tail values for the northern coastal wren population in themselves are not necessarily indications of *sandiegensis* influence. Coupled with reduced buffy abdominal wash, the higher tail scores probably do reflect some genetic influence from the south. Unfortunately, the extensive soiling of Los Angeles Basin birds makes this color character difficult to

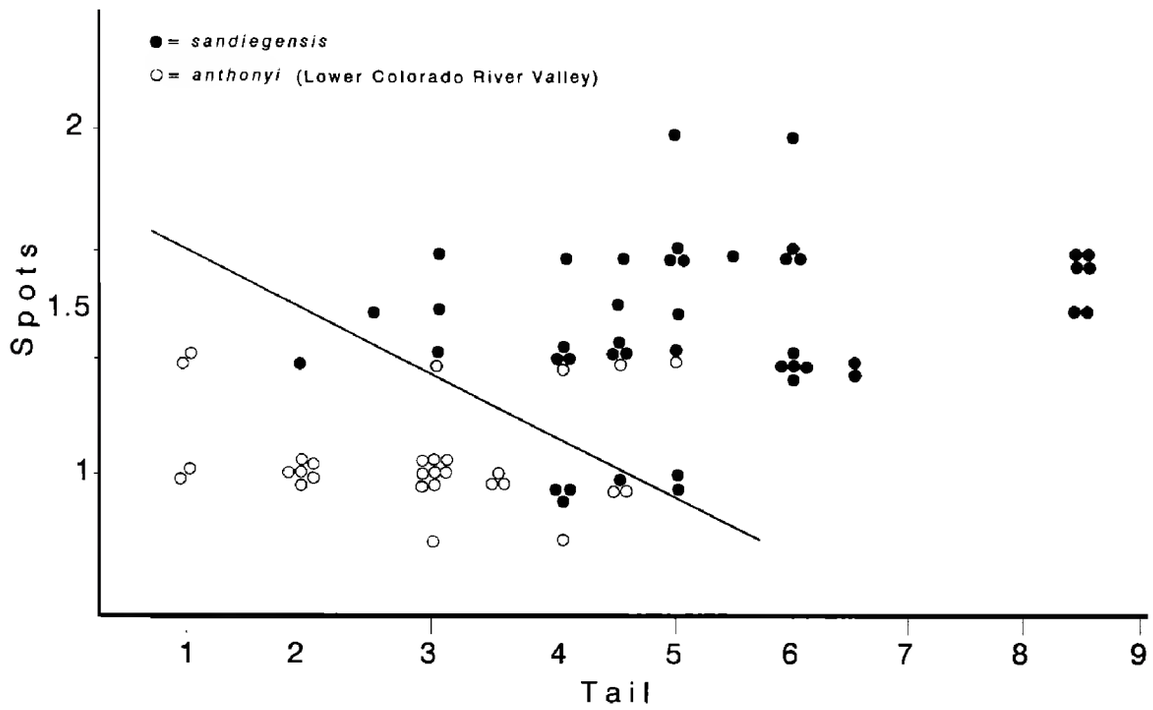


Figure 12. Scatter diagram of abdominal spotting (character 3) plotted against tail pattern (character 7) in two races of the Cactus Wren. All but five specimens of *C. b. sandiegensis* (89.1%) are separated from all but four specimens of *C. b. anthonyi* by the line effecting maximum separation. Northern specimens from Los Angeles and Ventura counties east to the Coachella Valley have been excluded; these show slight genetic influence of *sandiegensis*. For scoring of characters, see Tables 2 and 3 and Figure 6.

evaluate. Nine northern specimens (15.6% of those scorable) had tail values of 5 to 6, which we interpret as an indication of *sandiegensis* genes.

Although their distribution is patchy, coastal Cactus Wrens, as noted earlier, extend as far north as southern Ventura County. Los Angeles Basin birds were narrowly connected with desert birds through San Gorgonio Pass, an avenue of possible gene flow of desert characters west into the Los Angeles area, resulting in the present genetic condition of that population. Several Coachella Valley specimens (SD) suggest possible gene flow in the opposite direction.

Specimens from Northeastern Baja California

Desert *anthonyi* and peninsular *bryanti* (or *affinis*?) must come into contact along the gulf coast east of the Sierra San Pedro Mártir, between San Felipe and latitude 29°N (see Figure 1). Apparently Cactus Wrens have never been collected there because the region lacks adequate roads. This area merits further study, as the two gnatcatcher species, *Polioptila melanura* and *P. californica*, overlap there without interbreeding (Atwood 1988). There is indirect evidence that this is not the case with Cactus Wrens. The few specimens available from San Felipe on the northern peninsular gulf coast (SD, all spring) suggest that this population is influenced by a peninsular form. Nine of the 11 San Felipe specimens are in juvenal plumage. Their tails score 3, 3.5, 4 (2), 4.5 (2), 5, and 8 (2). One (SD 32660) is far along in postjuvenal molt. Its large single chest spots, small abdominal spots, and paler upperparts are those of *anthonyi*, but its dilute abdominal wash is yellowish buff as in *bryanti* rather than buffy ochre as in *anthonyi*. One adult (SD 32658) has single chest spots and a tail score of 3.5 but rather heavy abdominal spotting and dark upperparts, suggesting *bryanti* (or *affinis*) influence. The other adult (SD 10463) looks like *anthonyi* but has a distinct white spot on all the black rectrices.

Two spring adult males (SD) from Aguajito Spring, Valle de la Trinidad, Baja California, are indistinguishable from *sandiegensis*. One has large single chest spots and a heavy chest patch, while the other has twin spots and chevrons on the throat and chest. Both have relatively heavy flank spotting, reduced abdominal buff, and dorsal coloration warmer than that of *couesi* or *anthonyi* in comparable seasonal wear. Their tail scores are 4 and 5. The other six characters average 1.5 and 1.46, respectively.

Four juveniles from Valle de la Trinidad (SD, 14 July) lack abdominal spots and are only lightly spotted on the throat. Their upperpart colors are warm, as in *bryanti*. Two have mostly black tails (2, 2) and two have heavily barred tails (8, 9). This colony, apparently isolated from *sandiegensis*, seems anomalous. At this locality Atwood (1988:18) discovered limited contact between the California Gnatcatcher and the Black-tailed Gnatcatcher. Atwood stated that "the former species occurs primarily in widespread sage scrub vegetation dominated by *Artemisia*, *Salvia*, and *Rhus*, whereas the latter is generally restricted to typical (but limited in extent) Sonoran desert wash vegetation dominated by *Prosopis*."

Like *sandiegensis*, the Cactus Wrens of Tiburón Island (*C. b. seri*) combine characters of the two major evolutionary groups. They resemble

continental birds from the adjacent mainland (characters 1[?], 2, 4[?], 7) but have larger spotting on the abdomen (character 3). In reduction of abdominal buff wash (character 5), they are intermediate toward peninsular birds. Their bills are shorter than either peninsular, continental, or coastal forms (Rea 1986). They occupy a range approximately half the size of that of *C. b. sandiegensis*, as here restricted.

Field Identification

Our experience with this bird indicates that nearly all adults of *sandiegensis* individuals can be identified as such in the field except when they are in worn plumage (late spring and summer). San Diego Cactus Wrens have a smudgy appearance, as the large spots of the flanks and abdomen present an extension of the dark chest patch. Most individuals also show a light buffy wash on the flanks. In contrast, north coastal and desert birds can be readily recognized by the clear demarcation between the black chest patch and light belly, which is very finely speckled. The richer cinnamon buff of most of these individuals extends across both flanks and abdomen.

We also can recognize a distinct song dialect in southern coastal wrens. Their vocalizations have a slightly slower frequency and lower pitch than more northern and eastern birds, and have a raspy quality not heard in adjacent populations. This behavioral aspect deserves further study.

Subspecies Limits

Too few specimens exist to determine whether there is north–south clinal variation within *sandiegensis*. There are large gaps in specimen representation, with nothing from northern San Diego County (including all of Camp Pendleton) or southern Orange County. We included these areas in the range of *sandiegensis* on the basis of field observations and vocalizations (San Diego-type dialect). Central and northern Orange County wrens sing the Los Angeles Basin dialect. Within the northern coastal segment (even with the larger sample size, 67 adult specimens), we were unable to segregate a coastal versus a more interior subset or a northwest to southeast cline in characters. Considerable individual variation occurs at each locality. The largest sample from a single locality (28 specimens from the San Fernando Valley) shows a scattering of intermediate traits in all characters except 2 (chest spot shape). Scores of one sample, of nine adults and two juveniles from Claremont, were discordant. While body scores were consistently low except apparently for character 5 (abdominal color), 10 tails scored high (from 4 to 5.5) and one scored low (2).

Only three specimens (SD) are known to us from the isolated Ventura County population. Owing to molt or seasonal wear, these could not be scored for all characters. One (SD 45699) shows southern influence in characters 3, 4, 5, and 7. Habitat just east of Camarillo is still rather extensive and population numbers are relatively high for the north.

Northern coastal Cactus Wrens, with their very different genetic composition, must have had an evolutionary history different from that of *sandiegensis*. Either they were derived directly from *anthonyi* ancestors

from the desert, then received genetic influence from the south along the coast, or a pre-existing *sandiegensis*-like population has continued to experience genetic swamping by desert birds. Before urbanization of the Los Angeles Basin, colonies were open to at least narrow genetic contact through the San Gorgonio Pass. During hotter, dryer periods of the Holocene (if there were any), the contact here presumably would have been greater. But there was at least some contact with the south, as evidenced by occasional individual characters such as large ventral spots, white-barred tails, or reduced abdominal buff.

POPULATION STATUS

Methods

To determine the distribution and numbers of the San Diego Cactus Wren, we reviewed localities on specimen labels (both study skins and egg sets), checked areas of previously known occurrence, solicited information from local field ornithologists, and surveyed areas where appropriate habitat was likely to occur.

The generalized vegetation map of San Diego County (Oberbauer 1977) helped us determine where large blocks of coastal sage scrub occurred within that county. Our early surveys also indicated that the distribution of cacti, in which the wren nests almost exclusively, is correlated strongly with soil type. The maps of the *Soil Survey of the San Diego Area* (Bowman 1973) suggested additional, smaller areas potentially supporting cactus associations. Locations with cacti were then surveyed on foot. We began field surveys in 1980, with the greatest effort in 1984 and 1985. During 1988, 1989, and 1990, we revisited most areas that had wrens in 1984 and 1985. Through August 1990, approximately 285 hours had been devoted to field surveys.

Censusing was by direct count, aided by playing tapes of Cactus Wren songs, to which the wrens are very responsive. During field surveys, we also collected data on nests. We obtained information on territory size, shape, and location by conducting breeding bird censuses (Weaver 1982, Weaver in press) and winter bird censuses (unpublished) in accordance with procedures suggested by Hall (1964), Kolb (1965), and Van Velzen (1972).

Distribution

Our review of specimens confirms the San Diego Cactus Wren's occurrence from the San Dieguito River in west-central San Diego County to the Tijuana and Valle de las Palmas regions in northwestern Baja California (Figure 13). Our field observations also indicate that *sandiegensis* ranges north through northwestern San Diego County to San Juan Creek in southern Orange County.

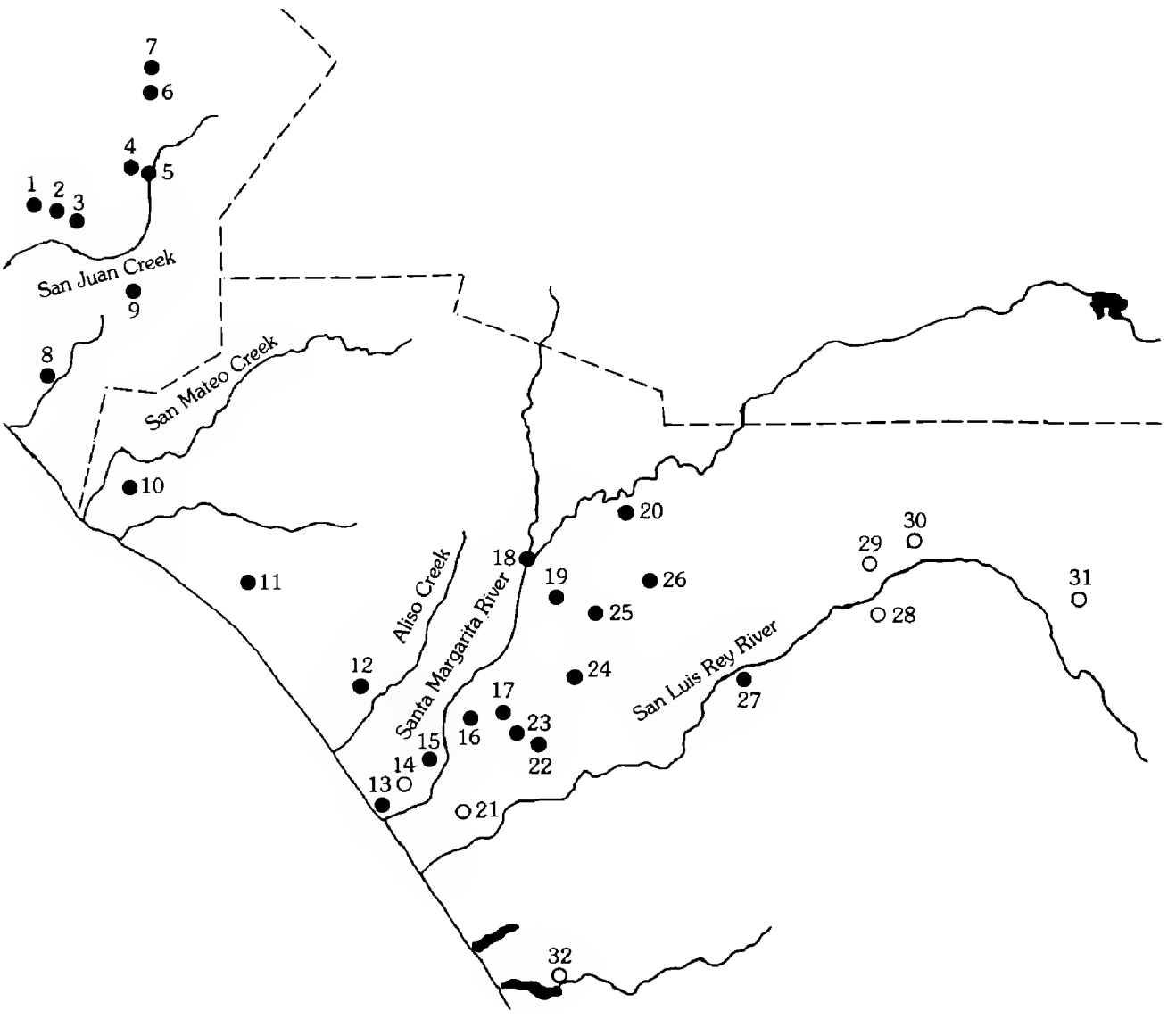
The Peninsular Ranges of San Diego County and northern Baja California separate *sandiegensis* from the nearest populations of the desert race, *anthonyi*, by a minimum of 50 km. The Agua Tibia Mountains on the northern border of San Diego County separate *sandiegensis* by only 14 km from Riverside County birds that are very similar in appearance to the

northern coastal population. The Plano Trabuco separates it from northern coastal birds by less than 5 km in southern Orange County. The Cactus Wrens of the Coto de Caza area, near Trabuco Canyon, Orange County, should be studied because they are situated between *anthonyi*-like and *sandiegensis*-like populations.

Coastal Cactus Wrens recently occurred as far inland as Pauma Valley in San Diego County, 48 km from the coast (a population now exterminated), but most live within 32 km of the sea. Most wrens live at elevations of less than 150 m. We have found them as high as 400 m in San Diego County, while Schneebeck (1978) recorded the birds in Orange County at the upper limits of the coastal sage scrub at 450 m above sea level.

The wren's distribution is highly fragmented, and most populations consist of only a few pairs. In San Diego County, the wrens are concentrated along the Otay River and its tributaries, near Lake Jennings, in the interior valleys of the San Dieguito River, and near the Santa Margarita River. In Orange County, most wrens are found along the mid-section of San Juan Creek and its northeastern tributaries. A detailed account of distribution and numbers is given in the Appendix 2.

A



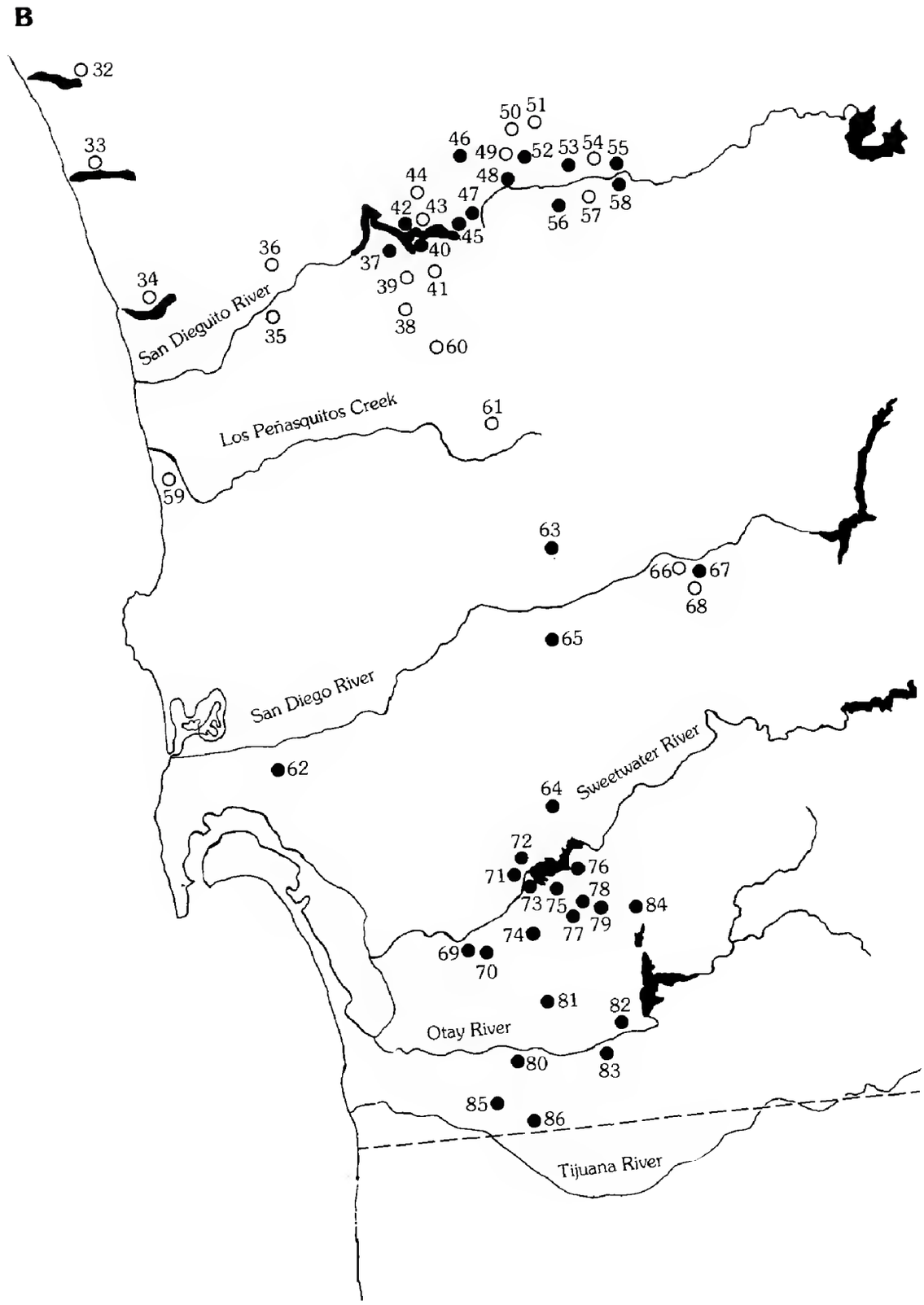


Figure 13. Localities where the San Diego Cactus Wren (*C. b. sandiegensis*) has occurred since 1980. A, southern Orange County and northern San Diego County; B, central and southern San Diego County. Solid circles, colonies still extant; open circles, colonies lost during the 1980s. The single locality in Baja California where the San Diego Cactus Wren has been reported since 1980, Valle de las Palmas, is shown in Figure 2.

Areas that were not checked but would appear to provide suitable habitat include northwestern Camp Pendleton below the Border Patrol checkpoint in San Diego County (Larry Salata pers. comm.) and Gabino Canyon and the north end of Cañada Gobernadora in southern Orange County. Additional surveys are also recommended for the Starr Ranch Audubon Sanctuary in Orange County.

Current Numbers

Our counts and those of other active field workers conducted over the past decade show that the San Diego Cactus Wren has a very small and rapidly declining population. As of fall 1990, approximately 200 pairs still inhabit San Diego County and 150 pairs still inhabit Orange County. In Baja California, fewer than 10 pairs are present at Valle de las Palmas south of Tecate, the only currently known area of occurrence south of the border. The habitat here has been seriously degraded by burning, grazing, and conversion to vineyards during the past two decades (Marcos Camacho pers. comm.)

Former numbers of *sandiegensis* are speculative, but the scattered populations still present in the early to mid-1980s suggest that they were once numerous near all of the lagoons and coastal canyons in San Diego and southern Orange counties.

The decrease in this bird's numbers has been apparent to field workers for decades. Dawson (1923:667) first called attention to the seriousness of the decline of the coastal population: "All proper desert areas west of San Gorgonio Pass are being threatened by human invasion. The Cactus Wren has receded from many parts of the San Diego–Ventura section already, and is in danger of being altogether cut off."

Willett (1933) noted the species' decline at its northern limits: "Reported by Evermann (1886) as rather common resident of Ventura County in early 80s, but apparently much less plentiful in that section at the present time, as land has been largely cleared for agricultural purposes." Whereas J. S. Appleton had found the bird a "formerly common resident of Simi Valley, southern Ventura County," by 1933 it had not been seen there "for several years past."

In 1944, Grinnell and Miller described the range of the coastal populations of southern California as "much restricted as compared with conditions in 1880s and 1890s, owing to great reduction of requisite habitat." Sams and Stott (1959) observed that the wren was "found sparingly in the coastal lowlands (near San Diego)," and, referring to the San Diego County coast, Unitt (1984) stated that "in 1981, the species is found in very few localities."

By August 1990, we could find no wrens at 26 of the 78 sites (33%) in San Diego County where they had been recorded in the preceding decade. Even more alarming, the wrens have disappeared from 14 of the 27 sites that we or other field observers had censused in 1984–85 and again in 1988–90, and have decreased in numbers at another seven locations. We noted increases at only three sites. The number of pairs at these 27 sites dropped from 145 to only 102, a 30% decrease. We noted habitat

destruction at most of these sites. Grazing, clearing for agriculture, and fires contributed to the decrease, but construction of houses accounted for the majority of the population reductions or local extirpations. We do not know the extent of population losses in Orange County, but these must be substantial due to the accelerating growth in the south end of the county.

Continuing declines in population are a certainty. Well over 50% of all wrens occur on privately owned lands. Virtually all of these areas are in imminent danger of development in the 1990s. Those wrens found on public lands, including the largest remaining colonies, also face a dubious future. Many lie in the path of proposed highways (as across Rancho Mission Viejo along the proposed Foothill Transportation corridor in Orange County and in the Sweetwater and Otay River valleys in San Diego County or along existing highways where increasing pressure for "improvements" will greatly reduce habitat for the wren (as in Caspers Wilderness Park).

Another cause for concern includes the accidental fires resulting from training exercises on Camp Pendleton and policies that encourage "controlled" burns, such as those that have taken place at the San Diego Wild Animal Park. Benson (1969) considered fire to be the chief limiting factor in the distribution of cacti in southern California, so it is disconcerting to see preventable habitat destruction of a rapidly vanishing natural resource.

Isolated populations of birds of the coastal sage scrub have high rates of extinction according to a recent study in San Diego County (Soulé et al. 1988). Our studies of the Cactus Wren certainly corroborate this. Soulé's team found the wren in only one of the 37 canyons they surveyed. Their studies emphasized that sage scrub birds disappear from isolated "islands" of habitat owing to their low initial numbers and their inability to cross urbanized areas to repopulate these remnants.

All 26 sites in San Diego County where we documented the bird's disappearance had populations of fewer than five pairs. Eighteen of these still retain sage scrub remnants that should support, on a strictly spatial basis, at least a pair of wrens. From their recent history of disappearance, it should be of concern that in this county, which supports the largest remaining numbers of wrens, only 10 of the 52 remaining sites support five or more pairs.

ECOLOGY

Habitat Requirements

San Diego Cactus Wrens adhere strictly to coastal sage scrub throughout the year. Areas supporting this plant community are dry, receiving even less rainfall than the chaparral above, at higher elevations. Coastal sage scrub may extend inland as far as 50 km, but more often is within 30 km of the coast. Species diversity is high. Some characteristic shrubs include Flat-top Buckwheat, *Eriogonum fasciculatum*; California Sagebrush, *Artemisia californica*; White Sage, *Salvia apiana*, and Black Sage, *S. mellifera*. Often there are scattered shrubs approaching tree size—Laurel Sumac, *Malosma laurina*, and Lemonadeberry, *Rhus integrifolia*. Some compo-

nents of this community are from the Sonoran Desert or have their closest relatives there: Coast Barrel Cactus, *Ferocactus viridescens*; Fish-hook Cactus, *Mammillaria dioica*; California Wolfberry, *Lycium californicum*; Bladderpod, *Cleome isomeris* (= *Isomeris arborea*); San Diego Sunflower, *Viguiera laciniata*; Chalk-lettuce, *Dudleya pulverulenta*; California Encelia, *Encelia californica*; Our Lord's Candle, *Yucca whipplei*; Spanish Dagger or Mojave Yucca, *Yucca schidigera*; Jojoba, *Simmondsia chinensis*

Figure 14. Nest of the San Diego Cactus Wren in *Opuntia littoralis* on Bernardo Mountain, near Escondido, San Diego County, November 1988.

Photo by Kenneth L. Weaver

(see Raven and Axelrod 1978). Our breeding and winter censuses indicate that the wrens prefer areas dominated by California Sagebrush and Flat-top Buckwheat and tend to avoid locations dominated by sages.

The wren's chief requisite, though, is tall *Opuntia* cacti. The wrens supplement their insect diet in fall and winter by feeding on the fruit of two species of *Opuntia*. Most important, the cacti provide the only firm support for the wren's bulky, pouch-shaped nests, which are used not only for raising young but also for nighttime roosting throughout the year (Figure 14).

The bird's almost exclusive selection of tall cacti for nest placement is corroborated by our nest records. We have located 584 nests in coastal San Diego and Orange counties. All but two were found in *Opuntia*. The exceptions were located in particularly robust individuals of the Yellow Bush Penstemon (*Keckiella antirrhinoides*). The median height of cacti in which the wrens placed their nests was 138 cm (n = 98, range 74–226 cm), while the median height of the nests was 94 cm above ground (range 40–165 cm). The wrens are absent from areas where only low, sprawling cacti grow.

Nest counts are not a reliable indicator of wren populations. We have found up to a dozen nests within the territory of a single pair of wrens.

The wrens nest in three native species of *Opuntia*: the Coastal Cholla (*Opuntia prolifera*) and two species of prickly-pear (*O. littoralis* and *O. oricola*). Coastal Cholla is the typical choice in southern San Diego County

Figure 15. Sage scrub dominated by Coastal Cholla (*Opuntia prolifera*) near Sweetwater Dam, San Diego County, May 1990. Coast Barrel Cacti (*Ferocactus viridescens*) are also common at this locality.

Photo by William T. Everett

where large prickly-pears are scarce (Figure 15). Definite nesting preferences by the wren are not obvious where both cholla and prickly-pears grow abundantly. For example, of 32 nests found at Agua Hedionda Lagoon, 16 were located in cholla, 16 in prickly-pears; Santa Margarita River nests included 18 (42%) in cholla, 39 (58%) in prickly-pears.

The two species of prickly-pear offer the only nesting sites in the interior valleys of the San Dieguito and San Luis Rey rivers in San Diego County. Nest selection varies greatly. Twenty-eight of 34 nests (82%) on Bernardo Mountain near Escondido (Figure 16) were built in the more abundant *Opuntia littoralis*, but all 11 nests of a remnant population near Pala were found in *O. oricola* (Figure 17).

Tall *Opuntia* cacti capable of supporting the wren's nests are found primarily on south-facing slopes or at the bases of hillsides within 400 m of river valleys. They are also on hillsides along tributary canyons, mainly those with south- and west-facing slopes. Along San Juan Creek in Orange County (Figures 18 and 19) and the Otay River in San Diego County, tall *Opuntia* cacti grow right on the edges of the washes, a situation that once probably existed along many other rivers. Dense patches inhabited by wrens are also found where coastal sage scrub forms a ground cover in the very open woodland of Coast Live Oaks (*Quercus agrifolia*) and California Sycamores (*Platanus racemosa*) along San Juan Creek and some of its tributaries, such as Bell and Crow canyons (Nagata 1982; Gundy and

Figure 16. Sage scrub dominated by the prickly-pear *Opuntia littoralis* on the south slope of Bernardo Mountain, near Escondido, San Diego County, November 1988.

Photo by Kenneth L. Weaver

Flanagan 1978). The association of the wrens with tall *Opuntia* growing along canyons is so striking that the simplest way to locate the birds is by watershed.

Using spot-mapping techniques (Hall 1964), we determined the approximate size of territories for 13 pairs of wrens in south Escondido in San Diego County. Territories ranged in size from 0.8 ha to 2 ha, with an

Figure 17. Sage scrub dominated by the prickly-pear *Opuntia oricola* at San Pasqual Battlefield Historical Park, San Diego County, May 1990. The type locality of *C. b. sandiegensis*, the San Diego Wild Animal Park at San Pasqual, is less than 1 km away.

Photo by Kenneth L. Weaver

average of 1.3 ha. In Arizona, Anderson and Anderson (1973) found territories to range from 1.2 to 2.8 ha and average 1.9 ha.

San Diego Cactus Wrens we studied centered their territories on narrow draws, where cacti tend to be more abundant and taller than on adjacent slopes. Most territories tend to be roughly elliptical, corresponding to the downslope flow of the draws. Thus, there is a vertical as well as a spatial requirement for hillside-inhabiting wrens, a factor that has not been taken into consideration in mitigation efforts. The wash-dwelling wrens of San

Figure 18. Wash inhabited by San Diego Cactus Wrens in San Juan Creek, Casper's Wilderness Park, Orange County, April 1990.

Photo by Kenneth L. Weaver

Juan Creek lack a vertical component to their territories. However, the narrow distribution of cacti along the creek also causes the birds' territories to be elliptical or rectangular.

Associated Fauna

The avifauna associated with the San Diego Cactus Wren forms a small but distinctive assemblage. Birds recorded in significant numbers (greater than three pairs) on our census plots are the California Quail (*Callipepla*

Figure 19. Wash inhabited by San Diego Cactus Wrens in San Juan Creek, Casper's Wilderness Park, Orange County, April 1990.

Photo by Kenneth L. Weaver

californica), Costa's Hummingbird (*Calypte costae*), Bushtit (*Aegithalos minimus*), California Towhee (*Pipilo crissalis*), California Gnatcatcher (*Polioptila californica*), Rufous-crowned Sparrow (*Aimophila ruficeps*), and Sage Sparrow (*Amphispiza belli*). Where sumacs and other tall shrubs occurred, Bewick's Wren (*Troglogytes bewickii*), California Thrasher (*Toxostoma redivivum*), Wrentit (*Chamaea fasciata*), and Rufous-sided Towhee (*Pipilo erythrophthalmus*) also occurred in significant numbers.

A wide variety of mammals frequents the coastal sage scrub. Several rodents, such as the San Diego Pocket Mouse (*Perognathus fallax*), Agile Kangaroo Rat (*Dipodomys agilis*), and Desert Woodrat (*Neotoma lepida*), show a distinct preference for this habitat (Bleich 1973).

Although no reptiles are limited entirely to coastal sage scrub, two lizards restricted to southern California and listed by the California Department of Fish and Game as threatened, the Coast Horned Lizard (*Phrynosoma coronatum*) and the Orange-throated Whiptail (*Cnemidophorus hyperythrus*), are particularly common in this habitat (Eric Lichtwardt pers. comm.). The Red Diamond Rattlesnake (*Crotalus ruber*), in its U.S. distribution found only in southwestern California, is also especially abundant in the coastal sage scrub (Richard Zembal pers. comm.).

Certain insects are found primarily or exclusively in the coastal sage scrub, usually because of association with certain plants. Two examples are the moths *Megathymus comstocki* and *Tegeticula yuccasella* (on *Yucca schidigera*).

PALEOBIOGEOGRAPHY

The modern southern coastal sage scrub community that supports the San Diego Cactus Wren is itself anomalous in the otherwise mesic chaparral of the California Floristic Province. Most of the plant genera characterizing southern coastal sage scrub community, enumerated under Habitat Requirements, have their evolutionary centers of diversity in deserts, which themselves were more restricted in area generally and in more southern latitudes during the Pleistocene Epoch. Axelrod (1966) attributed these relictual desert components along the coast to the Xerothermic period (also called the Hypsithermal or Altithermal period) that followed the Wisconsin glaciation. According to Raven and Axelrod (1978:33), "The continued trend toward spreading drought, as in the Xerothermic periods of the Quaternary, allowed many taxa that are primarily associated with deserts to invade the dryer parts of the California Floristic Province." Many of these desert plant genera have evolved endemic species along the coast.

Axelrod (1978) believed that the southern coastal sage as a community is relatively young, occupying its present area only since the last glaciation, 12,000 years ago. He hypothesized that when grasslands in semiarid open areas among forests and woodlands began to lose summer precipitation, coastal sage vegetation replaced them. Tectonic events during the Quaternary Period elevated lowlands into mesas, which were then dissected by erosion, producing the slopes and thin, well-drained soils favored by coastal sage scrub. Sonoran Desert vegetation was moving northward on the

continent about the same time. Modern plant communities in the Southwest were probably in place by 4000 years ago (Van Devender et al. 1987).

Presumably, the California Gnatcatcher, which has evolved to the species level, and the San Diego Cactus Wren, which has not, invaded coastal areas between 12,000 and 4000 years ago. (Both represent genera having centers of diversity in subtropical or tropical regions.) Whether the subspecies *C. b. sandiegensis* represents a genetic mixing of traits derived from a dual invasion of *anthonyi* from the east and *bryanti* from the south is unknown. Alternatively, the San Diego Cactus Wren may have been derived from the intergrading of continental and peninsular birds in northeast Baja California (area of overlapping patterns in Figure 1) and later invaded its current range. Specimens (SD) from Valle de la Trinidad have traits characteristic of the subspecies *sandiegensis*, and specimens from San Felipe tend in that direction. In the modern vegetation, the coastal wrens, so far as known, are separated from Valle de la Trinidad by 140 km. The coastal California Gnatcatcher, however, with a broader niche in the sage scrub (it is not dependent on cactus), reaches and narrowly overlaps the desert Black-tailed Gnatcatcher in Valle de la Trinidad (Atwood 1988).

The taxonomic differences between the Cactus Wrens of the Los Angeles and San Diego areas are interesting in the light of apparent differences in the vegetative community. Axelrod (1950, 1966) has suggested that two segments of southern coastal sage scrub be recognized, a Venturan component and a San Diegan component.

CONSERVATION RECOMMENDATIONS

The San Diego Cactus Wren is particularly vulnerable because of the bird's restriction to a single type of habitat and strict dependence on a single genus of cacti for placement of its breeding and roosting nests. Rampant urbanization has caused an extremely fragmented distribution and a rapidly shrinking population. Most populations now consist of fewer than five pairs, and the bird appears to be unable to colonize suitable habitat that is surrounded by development. We believe this bird will not survive unless the following steps are taken:

1. Listing of *C. b. sandiegensis* as an endangered subspecies by the federal government;
2. Protection of large blocks of its habitat, the coastal sage scrub;
3. Maintenance of the habitat, including local suppression of fires.

SUMMARY

The Cactus Wrens of southern Orange County, coastal San Diego County, and extreme northwestern Baja California form a distinct subspecies, *Campylorhynchus brunneicapillus sandiegensis*. They are easily distinguishable in the hand and in the field from neighboring populations to the north, south, and east. Based on a mosaic of seven characters, *C. b. sandiegensis* differs from *C. b. anthonyi* of the transmontane desert by larger ventral spotting, reduced abdominal buff, and greater white tail

barring, and from *C. b. bryanti* of Baja California by its less brown dorsum, less barred tail, generally single-spotted chest feathers, and tendency toward a chest patch. This sedentary bird is highly dependent on coastal sage scrub containing tall *Opuntia* cacti. Fewer than 400 pairs remain. Rapid habitat destruction places this bird in serious danger of extinction. Cactus Wrens from the Los Angeles area of southern California are not taxonomically distinguishable from *C. b. anthonyi* of the adjacent desert, although some individuals show some genetic influence of *C. b. sandiegensis*.

ACKNOWLEDGMENTS

We acknowledge the following with thanks for assistance. William D. Toone of the Wild Animal Park negotiated permission from park authorities to collect the type specimens and to survey the park. Takashi Ijichi collected the type series. Jeanne L. Rogers volunteered her services drafting the maps and illustrations. Gregory K. Pregill prepared the graphs. William T. Everett provided photographic assistance. Thomas Oberbauer and Thomas Van Devender commented on the floristic and paleoenvironmental aspects. M. Ralph Browning, Kenneth C. Parkes, and Allan R. Phillips commented on the taxonomic sections. Philip Unitt lent his editorial skills toward the manuscript's improvement.

Curators in charge of collections at the institutions listed under Character Analysis kindly loaned specimens.

The following field observers furnished records and/or locations of Cactus Wrens in southern California: Richard Barber, Pam Beare, John Beezley, Linda Belloumini, David R. Bontrager, Timothy A. Burr, Slader Buck, Alice DeBolt, Pete DeSimone, Claude Edwards, Lenore Feinberg, the late Alice Fries, Nancy Gilbert, Glenn Greenwald, Jon and Jane Griffith, Daniel Guthrie, Don and Marjorie Hastings, Steve Huemner, Barry Jones, Kathy Keane, David King, Arthur Langton, Roc Lee, Eric Lichtwardt, Michael Long, H. Elliott McClure, Robert McKernan, Esther J. McNeil, Steve Montgomery, Thomas Oberbauer, Larry Salata, Robert Shanman, Doreen Stadtlander, Peter Tackney, Gerald Tolman, Philip Unitt, Richard Webster, and Harold Wier.

We also thank Donald Pohl and Thomas Cline for permission to survey the San Pasqual Battlefield State Historic Park and the U.S. Marine Corps for permission to survey Camp Pendleton. Information on Cactus Wren locations at the Fallbrook Naval Weapons Station was obtained under a study funded by the U.S. Navy, Naval Facilities Engineering Command.

Unfortunately, we had difficulty in acquiring a number of Cactus Wren records. This is a result of serious flaws in the way California's environmental impact review process is administered. Proprietary rights to scientific data gathered during biological surveys are assigned to landowners, not to the public. Dissemination of this information thus may be restricted; biologists who work for consulting firms may be restricted from sharing their data with the scientific community. We know of several instances where consultants have actually been fired when they reported rare birds and other wildlife. The environmental assessment process is in dire need of reform.

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Accepted 27 September 1990

APPENDIX 1. HISTORY OF THE NAME *CAMPYLORHYNCHUS*

Readers will note variations in the gender of the scientific name of the Cactus Wren. The species was described by Lafresnaye in 1835 as *Picolaptes brunneicapillus*. The generic name *Picolaptes* Lesson, 1830, with the type species *P. spixii*, is now a synonym of *Xiphorhynchus* Swainson, 1827, in the family Dendrocolaptidae (woodcreepers). The generic name *Campylorhynchus* was first proposed by Spix in 1824 for what is now *C. turdinus*, and the generic name was used by Gray in 1847 in combination with the specific name as *brunneicapillus*. The A.O.U. (1886, 1889) followed Gray. However, Palmer (1893), following the convention of nomenclature of that time, concluded that *Campylorhynchus* should be treated as a junior synonym of *Campylirhynchus* Megerle, 1821, a generic name of a beetle. The A.O.U. (1910, 1931) used the next available generic name, *Heleodytes* Cabanis, 1851, for the Cactus Wren. The fifth edition of the Check-list (A.O.U. 1957, first printing) returned to the use of *Campylorhynchus* Spix because the name is not preoccupied under current rules of nomenclature, but scientific names of the Cactus Wren were treated as neuter in gender. (In the second printing, an incorrect mixture of both masculine and neuter was used.) The neuter was followed in the original description of the San Diego Cactus Wren (Rea 1986), in conformity with other taxa in the genus written by Phillips (1986). In this paper, the masculine is used, as in the original species combination by Gray, the thirty-second supplement to the A.O.U. Check-list (1973), the sixth edition of the A.O.U. Check-list (1983), and according to the latest edition of the International Code of Zoological Nomenclature, which specifies that genera with the masculine ending *-us* be treated as masculine regardless of their derivation and gender in language of origin.

APPENDIX 2. RECORDS OF THE SAN DIEGO CACTUS WREN SINCE 1980

Location	Most Recent Survey[a] Count	Most Recent Survey[a] Territorial Males	Previous Survey Count[b]	Previous Survey Territorial Males	Notes[c]
San Juan Creek[d]					
1. Rancho Mission Viejo	—	64	NPR	—	D
2. Rancho Mission Viejo	—	32	NPR	—	D
3. Rancho Mission Viejo	—	15	NPR	—	D
4. Caspers Park[e]	—	3	KS	—	
5. Caspers Park	19	13	KS	—	
6. Starr Ranch[e]	—	1	NPR	—	
7. Starr Ranch[e]	—	2	KS	—	
Segunda Deshecha Cañada					
8. San Clemente	1	1	NPR	—	
San Mateo/San Onofre Creeks					
9. Rancho Mission Viejo	—	13	NPR	—	D
10. Camp Pendleton	—	5	KS	—	
Unnamed creek					
11. Camp Pendleton	—	1	NPR	—	
Aliso Creek					
12. Camp Pendleton	—	2	NPR	—	
Santa Margarita River					
13. Camp Pendleton	—	1	NPR	—	
14. Camp Pendleton	0	0	1	1	
15. Camp Pendleton	—	5	11	10	
16. Camp Pendleton	—	3	KS	—	
17. Camp Pendleton	—	1	NPR	—	
18. Camp Pendleton	1	1	NPR	—	
19. Naval Weapons Station	17	—	NPR	—	
20. Naval Weapons Station	2	—	NPR	—	
San Luis Rey River					
21. Camp Pendleton	ON	—	KS	—	
22. Camp Pendleton	—	1	NPR	—	
23. Camp Pendleton	—	3	11	9	F
24. Camp Pendleton	—	2	NPR	—	
25. Camp Pendleton/ Naval Weapons Station	11	—	NPR	—	
26. Naval Weapons Station	1	—	NPR	—	
27. Bonsall	5	2	3	2	
28. Lilac	0	0	N	—	

Continued

Location	Most Recent Survey[a] Count	Most Recent Survey[a] Territorial Males	Previous Survey Count[b]	Previous Survey Territorial Males	Notes[c]
29. Pala	0	0	2	1	
30. Pala	0	0	N	—	
31. Pauma Valley	0	0	3	3	F
Agua Hedionda Creek					
32. Agua Hedionda Lagoon	0	0	5	4	R
San Marcos Creek					
33. Batiquitos Lagoon	0	0	1	1	R
Escondido Creek					
34. San Elijo Lagoon	0	0	—	2	A
San Dieguito River					
35. Rancho Santa Fe	0	0	N	—	
36. Rancho Sante Fe	ON	—	NPR	—	
37. Rancho Bernardo	—	1	NPR	—	
38. Rancho Bernardo	0	0	3	1	R
39. Rancho Bernardo	0	0	KS	—	R
40. Rancho Bernardo	5	1	5	1	D
41. Rancho Bernardo	0	0	3	2	R
42. Escondido	21	12	23	18	F, R
43. Escondido	0	0	1	1	R
44. Escondido	0	0	1	1	R
45. Escondido	20	13	—	19	R
46. Escondido	1	1	8	4	F
47. Escondido	2	1	3	2	R, G
48. Escondido	4	3	3	2	R
49. San Pasqual Valley	0	0	2	2	R, A
50. San Pasqual Valley	0	0	6	3	R, A
51. San Pasqual Valley	0	0	1	1	R
52. San Pasqual Valley	2	2	—	5	G
53. San Pasqual Valley	54	38	54	48	F
54. San Pasqual Valley	0	0	1	1	A
55. San Pasqual Valley	2	1	2	2	
56. San Pasqual Valley	6	4	—	6	
57. San Pasqual Valley	0	0	1	1	A
58. San Pasqual Valley	2	1	2	1	
Los Peñasquitos Creek					
59. Torrey Pines State Res.	0	0	1	1	
60. Poway	0	0	5	2	R
61. Poway	0	0	N	—	R

Continued

Location	Most Recent Survey[a] Count	Most Recent Survey[a] Territorial Males	Previous Survey Count[b]	Previous Survey Territorial Males	Notes[c]
San Diego River					
62. San Diego	1	1	1	1	
63. Santee	3	2	10	—	D
64. Spring Valley	—	1	NPR	—	R
65. El Cajon	1	1	1	1	
66. Lakeside	0	0	1	1	
67. Lakeside	33	18	10	8	D
68. Lakeside	0	0	1	1	
Sweetwater River					
69. Chula Vista	5	—	NPR	—	D
70. Chula Vista	2	1	NPR	—	
71. Sunnyside	1	—	NPR	—	D
72. San Diego	N	—	NPR	—	D
73. Sweetwater Reservoir	13	8	KS	—	D
74. Sunnyside	3	2	KS	—	D
75. Mother Miguel Mt.	—	3	—	2	D
76. Mother Miguel Mt.	2	2	10	5	D
77. S of Mother Miguel Mt.	—	1	NPR	—	D
78. S of Mother Miguel Mt.	2	1	NPR	—	D
79. S of Mother Miguel Mt.	1	1	6	3	D
Otay River					
80. Dennery Canyon	6	3	NPR	—	D
81. Rancho Otay	6	—	6	—	D
82. Rancho Otay	27	—	37	—	D
83. Rancho Otay	16	—	2	—	D
84. Proctor Valley	1	—	1	1	D
Tijuana River					
85. Otay Mesa	2	1	NPR	—	D
86. Spring Canyon	2	1	NPR	—	D
87. Valle de las Palmas	5	1	KS	—	A

[a]N, nests found; ON, remnants of old nests found.
[b]KS, known site, no record available; NPR, no previous record.
[c]A, habitat destruction due to agricultural clearing; D, proposed development; F, habitat destruction due to fire; G, habitat destruction due to grazing; R, habitat destruction due to residential construction.
[d]Results of Orange County Breeding Bird Atlas indicate a minimum of 50 pairs in this portion of the San Juan Creek drainage basin but data are not listed according to specific locations.
[e]Data resulting from breeding bird censuses, not strictly surveys.

Details of San Diego Cactus Wren Locations and Surveys

Orange County, California

San Juan Creek

1. Rancho Mission Viejo, W side of Cañada Chiquita, from San Juan Creek N approx. 5 mi. Oct 1989–Jan 1990 (DB).
2. Rancho Mission Viejo, W side of Cañada Gobernadora from San Juan Creek N 3 mi., W across ridge to E side Cañada Chiquita, then N 2 mi. Oct 1989–Jan 1990 (DB).
3. Rancho Mission Viejo, W side of Cañada Gobernadora from San Juan Creek N approx. 2.25 mi. Oct 1989–Jan 1990 (DB).
4. Caspers Regional Park, Bell Canyon. 23 Apr–24 May 1981 (PF & KA).
5. Caspers Regional Park, San Juan Creek, from park road crossing to 1.5 mi. E. 12 Feb and 19 Apr 1990 (KW).
6. Starr Ranch Audubon Sanctuary, Crow Canyon, 5.5 mi. SE of Trabuco Oaks Post Office. 16 Apr–24 May 1981 (JN).
7. Starr Ranch Audubon Sanctuary, S side of Pruesker Peak, 5.1 mi. N of entrance to Caspers Regional Park. 15 Apr–20 May 1982 (RB).

Segunda Deshecha Cañada

8. San Clemente, NW corner intersection of Marblehead Dr. and Avenida Pico. 19 Apr 1990 (KW).

San Mateo Creek

9. Rancho Mission Viejo, Cristianitos Canyon area from Hwy. 74 S approx. 3 mi. Oct 1989–Jan 1990 (DB).

San Diego County, California

San Mateo/San Onofre Creeks

10. Camp Pendleton, NW and S slopes of ridge on N side of Basilone Rd., approx. 1.5 mi. E of Interstate 5. 1983 (HW); spring 1989 (LS).

Unnamed creek

11. Camp Pendleton, SW slope of Horno Hill, approx. 0.5 mi. NW of intersection of old Highway 1 and Horno Canyon. Spring 1989 (LS).

Aliso Creek

12. Camp Pendleton, SW slope below hills 765 and 693, S side of Las Pulgas Rd., E side of Stuart Mesa Rd. Spring 1989 (LS).

Santa Margarita River

13. Camp Pendleton, N side of mouth of Santa Margarita R., W of Interstate 5. Spring 1989 (LS).
14. Camp Pendleton, N side of Santa Margarita R., W of Stuart Mesa Rd. 18 Jul 1984 (KW); spring 1989 (LS).
15. Camp Pendleton, N side of Santa Margarita R., between Stuart Mesa Rd. and Basilone Rd. 18 Jul and 4 Aug 1984 (KW); spring 1989 (LS).
16. Camp Pendleton, N side of Pueblitos Canyon, E of Vandegrift Blvd. Spring 1989 (LS).
17. Camp Pendleton, W slope of hill 492, NE side of head of Pueblitos Canyon, SE of base radio tower. Spring 1989 (LS).
18. Camp Pendleton, 300 yards S of confluence of Santa Margarita R. and De Luz Creek. 1982 (RZ).

19. Naval Weapons Station (Fallbrook Annex), W slopes of hills 650, 592, and 472, W and SW edge of base. Spring 1989 (DS).
20. Naval Weapons Station (Fallbrook Annex), ridge line between water tanks, NE end of base. Spring 1989 (DS).

San Luis Rey River

21. Camp Pendleton, Wire Mt., N of Santa Margarita School. 18 July 1984 (KW).
22. Camp Pendleton, E side of Windmill Canyon, SE slope of hill 425, E of golf course club house. Spring 1989 (LS).
23. Camp Pendleton, W side of Windmill Canyon, W of golf course, N to base radio tower. 4 Aug 1984 (KW); spring 1989 (LS).
24. Camp Pendleton, Pilgrim Creek N of Vandegrift Blvd. and S of firing range. Spring 1989 (LS).
25. Camp Pendleton/Naval Weapons Station (Fallbrook Annex), Pilgrim Creek on Camp Pendleton immediately S of border with Naval Weapons Station N 0.5 mi. to slopes E and W of Fallbrook Rd. Spring 1989 (LS); spring 1990 (DS).
26. Naval Weapons Station (Fallbrook Annex), E border of base, approx. 0.5 mi. S of Fallbrook Community Air Park. Spring 1990 (DS).
27. Bonsall, N side West Lilac Rd. 1.3 mi. E of intersection with Camino del Rey. 18 Aug 1989 (KW); 25 Aug 1990 (KW).
28. Lilac, E side of Couser Canyon Rd., 1 mi. S of intersection with Hwy. 76. 27 Dec 1989 (KW); 21 Jun 1990 (KW).
29. Pala, N side of Hwy. 76, 4 mi. E of intersection with Interstate 15. 16 Mar 1985 (KW); 25 Aug 1990 (KW).
30. Pala, N side of Hwy. 76, hill W of intersection with Pala Rd. 16 Mar 1985 (KW); 13 Nov 1988 (KW).
31. Pauma Valley, uppermost Adams Dr. 16 Apr 1985 (KW); 3 Feb 1990 (KW).

Agua Hedionda Creek

32. Carlsbad, Agua Hedionda Lagoon, N side of Lake Dr., W of intersection with Kelly Dr. 3 Mar 1984 (KW); 3 Dec 1988 (KW).

San Marcos Creek

33. Carlsbad, Batiquitos Lagoon, W side Batiquitos Dr. 20 May 1984 (KW); 3 Dec 1988 (KW).

Escondido Creek

34. Encinitas, San Elijo Lagoon, NE of intersection of Interstate 15 and Manchester Ave. 6 Sep 1981 (DK & CE); 1 Apr 1984 (KW).

San Dieguito River

35. Rancho Santa Fe, SE side of confluence of Lusardi Creek and San Dieguito R. Aug 1983 (HW); 9 Mar 1985 (KW).
36. Rancho Santa Fe, NW of intersection of Del Dios Hwy. and Camino del Norte. 9 Mar 1985 (KW).
37. Rancho Bernardo, hills W of SE arm of Lake Hodges, W of Interstate 15. "Early 1980s" (EM).
38. Rancho Bernardo, W of intersection of Camino del Norte and West Bernardo Dr. 25 Aug 1984 (KW); 23 Dec 1989 (KW).
39. Rancho Bernardo, Westwood area, N of Rancho Bernardo Rd. and W of Interstate 15. "Early 1980s" (EM).
40. Rancho Bernardo, ridge E of SE arm of Lake Hodges, W of Interstate 15. 1 Sep 1984 (KW); 16 Jun 1988 (PU), 18 May, 6 and 30 Jun 1990 (RB & PU).
41. Rancho Bernardo, NE of Interstate 15 and Bernardo Center Dr., W of Escala Dr. 1981 (KW).

42. Escondido, S slope of Bernardo Mt., hill 506 S of Lake Hodges boat landing. 8 Apr and 1 Sep 1984 (KW); 20 and 27 Nov 1988 (KW).
43. Escondido, N side of Lake Hodges, W of Interstate 15. 30 May 1981 (KW); 16 Jun 1985 (KW).
44. Escondido, N side of Clarence Lane W of Centre City Pkwy. 27 Jul 1981 (KW); 20 Apr 1990 (KW).
45. Escondido, S side of hill 765, NE of Lake Hodges. 28 Apr 1983 (KW); 25 Feb 1989 (KW).
46. Escondido, N of El Dorado Dr. between Bear Valley Pkwy. and Summit Dr. 28 Feb–20 Jun 1981 (KW); 20 Apr 1990 (KW).
47. Escondido, intersection of San Pasqual Rd. and Sunset. 18 Mar 1984 (KW); 13 Feb 1989 (KW).
48. Escondido, SE of intersection of San Pasqual Rd. and Old Pasqual Rd. 18 Mar 1984 (KW); 13 Feb 1989 (KW).
49. San Pasqual Valley, NE side of intersection of Cloverdale Rd. and Hwy. 78. 10 Mar 1984 (KW); 20 Apr 1990 (KW).
50. San Pasqual Valley, NE and SE of intersection of Cloverdale Rd. and Rockwood R. 23 Mar 1984 (KW); 13 Feb 1989 (KW).
51. San Pasqual Valley, E side of Rockwood Rd. 1 mi. N of intersection with Cloverdale Rd. 1989 (JG); 20 Apr 1990 (KW).
52. San Pasqual Valley, S side of hill 1017, N of Hwy. 78, E of Cloverdale Rd. 10 Mar 1984 (KW); 31 Dec 1988 (KW).
53. San Pasqual Valley, San Pasqual State Historical Park and San Diego Wild Animal Park, from 0.5 mi. E of entrance to Wild Animal Park to Guejito Creek. 2, 9, and 26 Jun and 3 Jul 1984 (KW); 17 and 31 Mar, 4 and 20 Apr 1990 (KW).
54. San Pasqual Valley, NW of Hwy. 78 bridge over Guejito Creek. 5 Jun 1983 (KW); 20 Apr 1990 (KW).
55. San Pasqual Valley, N side of Santa Ysabel Creek, due N of Crane's Peak. 9 Jun 1984 (KW); 20 Apr 1990 (KW).
56. San Pasqual Valley, SE of intersection of Bandy Canyon Rd. and Santa Ysabel Creek Rd. 23 Mar 1984 (KW); 13 Feb 1989 (KW).
57. San Pasqual Valley, S side of Bandy Canyon Rd., approx. 1.5 mi. E of intersection with Santa Ysabel Creek Rd. 23 Mar 1984 (KW); 20 Apr 1990 (KW).
58. San Pasqual Valley, W slope of Crane's Peak. 23 Mar 1984 (KW); 20 Apr 1990 (KW).

Los Peñasquitos Creek

59. San Diego, Los Peñasquitos Lagoon, Torrey Pines State Reserve, W of railroad tracks. 14 Mar 1984 (RW); 2 Mar 1985 (KW).
60. Poway, W of La Manda Rd. and N of Camino del Norte. 25 Aug 1984 (KW); 23 Dec 1989 (KW).
61. Poway, S of Gate Dr. 1981 (HW); 15 Aug 1984 (KW).

San Diego River

62. San Diego, Mission Hills, canyon between Fort Stockton Dr. and Washington Pl. 20 Mar 1986 (CE); 20 May 1990 (SH).
63. Santee, Fanita Ranch, E side of Sycamore Canyon NE of Santee Lakes. 29–27 Jul 1983 (CE); 13 May and 2 Jun 1989, 27 Jul 1990 (PU).
64. Spring Valley, N slope of Dictionary Hill, W of Lamar, S of Crest Dr. 18 Nov–2 Dec 1989 (GG).
65. El Cajon, Fletcher Hills, ridge between Travelodge Dr. and Murray Dr. Jul 1989 (EM); Mar 1990 (HW).
66. Lakeside, N of intersection of Lake Jennings Park Rd. and El Monte Rd. 13 Apr 1985 (KW); 9 Mar 1990 (KW).

67. Lakeside, Lake Jennings County Park and vicinity S of El Monte Rd. and E of Lake Jennings Park Rd. 13 Apr and 3 May 1985 (KW); 9 Mar 1990 (KW).
68. Lakeside, S of Lake Jennings Park Rd., N of Helix Water District building. 13 Apr 1985 (KW); 9 Mar 1990 (KW).

Sweetwater River

69. Chula Vista, E of Interstate 805 between Bonita Rd. and H St. 15 Aug 1989 (fide AMR).
70. Chula Vista, NW of intersection of East H St. and Ridgeback Rd. 27 Dec 1988 (KW).
71. Sunnyside, NW of intersection of Sweetwater Rd. and Quarry Rd. 4 May 1990 (PB, EB).
72. San Diego, Paradise Hills, Hwy. 54 at Briarwood Dr. Aug 1989 (JB).
73. Sweetwater Reservoir, SE of dam. 5 and 24 May 1990 (SS, SV, KW).
74. Sunnyside, Long Canyon W of Corral Canyon Rd. 27 Dec 1988 (KW).
75. Mother Miguel Mt., SW base, E end of San Miguel Rd., N of Wild Man's Canyon. 1989 (EL); 6 Apr 1990 (PU).
76. Mother Miguel Mt., W slopes. 23 Mar 1989 (EL); 6 and 18 Apr 1990 (PU).
77. S of Mother Miguel Mt., N side of Proctor Valley Rd. approx. 1 mi. W of intersection with Rancho Janal Dr. 18 Apr 1990 (JL).
78. S of Mother Miguel Mt., approx. 0.5 mi. N of Proctor Valley Rd. at S end of Wild Man's Canyon. 1989 (EL).
79. S of Mother Miguel Mt., 0.5 mi. N of Proctor Valley Rd., approx. 0.25 mi. W of intersection with Rancho Janal Dr. 1989 (EL); 6 Apr 1990 (PU).

Otay River

80. Dennery Canyon, N of Otay Mesa Rd., E of Interstate 805, and W of Otay Valley Rd. 15 Mar 1988 (HW).
81. Rancho Otay, Poggi Canyon. 1986–1988 (fide NG).
82. Rancho Otay, Otay R. SW of Lower Otay Reservoir, including Salt and Wolf canyons. 1986–1987 (fide NG).
83. Rancho Otay, Johnson Canyon (S of Otay River). 1986–1987 (fide NG); 7 Jun, 16–17 Jul 1990 (PB, SS, SV).
84. Proctor Valley, NW side of Proctor Valley Rd. N of Upper Otay Reservoir. 1987 (fide NG); 10 Mar 1989 (PU).

Tijuana River

85. Otay Mesa, W of Brown Field, S of Otay Mesa Rd. 22 Sep 1983 (RW).
86. Spring Canyon, SW of intersection of Otay Mesa Rd. and Cactus Rd. "Before 1986" (HW).

Baja California

87. Valle de las Palmas, E of Hwy. 3 on S-facing slopes, 0.5–1.0 mi. N of town of Valle de las Palmas. 27 Jul 1986 (AMR).

Sources: Richard Barber, Raymond Bransfield (Am. Birds 37:95, 1983), John Beezley, Tim Burr (U.S. Navy), Claude Edwards, Patricia Flanagan and Kent Armstrong (Am. Birds 36:88, 1982), Pam Beare (Caltrans), Ellen Berryman (Caltrans), David R. Bontrager, Nancy Gilbert (U.S. Fish and Wildlife Service), Glenn Greenwald, John Griffith, Steve Huemner, David King, Eric Lichtwardt, John Lovio, Julia Nagata (Am. Birds 36:87, 1982), Esther McNeil, Amadeo M. Rea, Larry Salata (U.S. Fish and Wildlife Service), Sue Scatolini (Caltrans), Doreen Stadtlander (U.S. Fish and Wildlife Service), Philip Unitt, Sandy Vissman (Caltrans), Kenneth Weaver, Richard Webster, Harold Wier, Richard Zembal (U.S. Fish and Wildlife Service).

BIRDS OF EAGLE MOUNTAIN, JOSHUA TREE NATIONAL MONUMENT, CALIFORNIA

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The Little San Bernardino Mountains of Riverside and San Bernardino Counties in southern California support a peninsula of oak-pine woodland running southeast from the higher San Bernardino Mountains (Figure 1). In spite of the continuity of the woodland connecting the two ranges, the birds of the Little San Bernardino Mountains are remarkably differentiated from populations to the west. Three subspecies requiring woodland are endemic to the range: a Mountain Quail, *Oreortyx pictus russelli*, a Plain Titmouse, *Parus inornatus mohavensis*, and a Bushtit, *Psaltriparus minimus sociabilis* (Miller 1946), and another, a Scrub Jay, *Aphelocoma coerulescens cana*, is endemic to the nearby Eagle Mountains (Miller 1946, Pitelka 1951).

Miller (1946), Pitelka (1951), and Miller and Stebbins (1964) discussed three alternative hypotheses for the origin of these differentiated populations. (1) The peninsula restricts gene flow from populations to the west. (2) The differentiated populations represent intergrades or hybrids between populations in the San Bernardino Mountains to the west and the Providence Mountains to the northeast. (3) A third hypothesis is one of faunal relaxation. Because as recently as 8000 years ago the Mojave Desert contained pinyon-juniper woodland (Wells and Berger 1967, Van Devender 1977), differentiated populations in the Little San Bernardino Mountains and other mountain ranges farther east may represent remnants of what was once a continuous distribution (Grinnell and Swarth 1913, Miller and Stebbins 1964). Hence, they may show traits that are either ancestral or intermediate owing to historical genetic interchange.

Information on populations of these species in the bits of woodland between the Little San Bernardino Mountains and the Providence Mountains is critical to assessing the latter two hypotheses. The Eagle Mountains, the Bullion Mountains, the Old Woman Mountains, and others provide elevated landscapes (Figure 1). Of these, only the Eagle Mountains are known to hold pinyon woodland, and this habitat is restricted to a small area (approx. 150 ha) around the peak of Eagle Mountain itself, in Joshua Tree National Monument. Eagle Mountain reaches a height of 1631 m, with a broad, flat valley at approximately 1460 m. Sparse woodlands of Single-leaf Pinyon (*Pinus monophylla*), California Juniper (*Juniperus californica*), and Scrub Oak (*Quercus turbinella*) occur above 1400 m. Eagle Mountain is isolated from the nearest woodland habitat in the Little San Bernardino Mountains by about 33 km of desert, the lowest point being Cottonwood Pass (914 m).

In the 1940s and 1950s, scientists from the Museum of Vertebrate Zoology (MVZ), University of California at Berkeley, led by Alden H. Miller, studied the vertebrates of the Monument. They visited Eagle Mountain twice (in May and October 1945) and assembled representative series of specimens from the area. Dennis Rainey and Richard Loomis of California State University at Long Beach apparently worked in the area briefly in the early 1960s. In 1986, George San Miguel of the Monument staff visited the area on several

occasions and recorded several important sightings. To my knowledge, these trips consistute the only ornithological work on the birds of Eagle Mountain prior to my visits. Information on other vertebrates known from Eagle Mountain was summarized by Miller and Stebbins (1964).

The purpose of this study is to summarize the existing information on the avifauna of Eagle Mountain. This paper represents an attempt to understand the historical processes leading to the differentiation of Mojave Desert edge forms of a number of bird species.

METHODS

As part of studies of the resident Scrub Jays (*Aphelocoma coerulescens cana*), I climbed Eagle Mountain four times: 13 May 1987, 14 May 1987, 14-15 March 1988, and 26-27 May 1988, each time with one other person, for a total of 102 observer-hours. Observations from visits to the area by other ornithologists are also summarized.

To check the validity of the five forms described as differentiated in the region [Mountain Quail, Scrub Jay, Plain Titmouse, Bushtit, and Bewick's Wren (*Thryomanes bewickii*)], I made comparisons of museum specimens in the collections of California State University at Long Beach (CSULB) and the Museum of Vertebrate Zoology (MVZ). At MVZ, the three specimens of the Scrub Jay from the Eagle Mountains were compared with other specimens from adjacent areas of the same age and sex, and collected in the same season and approximately the same years. At CSULB, I used the extensive series from the Little San Bernardino Mountains collected by Dennis Rainey and Richard Loomis to replicate the comparisons of Miller (1946), again controlling for variation due to age and sex, and year and season of collection.

RESULTS

Listed below are the species observed by the MVZ teams and by Rainey and Loomis (Miller and Stebbins 1964, A.H. Miller's field notes from the Field Note Collection at MVZ), by George San Miguel (pers. comm.), and by myself and my field companions. Habitat usage of species breeding in the Little San Bernardino Mountains is categorized into plant zones following Miller and Stebbins (1964): P, pinyon; Y, yucca; C, creosote. I do not describe the habitat usage of species that apparently do not breed in the region. Species presumed or known to breed on the mountain are indicated by an "x" or "*", respectively.

Red-tailed Hawk (*Buteo jamaicensis*). Single birds seen 13 May 1987 and 26 May 1988 soaring over peak. PYCx.

Golden Eagle (*Aquila chrysaetos*). Pair seen flying by north base 20 Oct 1945. PYCx.

Gambel's Quail (*Callipepla gambelii*). Seen 16 May and 19 Oct 1945. A covey of>20 flushed 26 May 1988 at Conejo Well. PYCx.

Mountain Quail (*Oreortyx pictus*). Collected 16 and 20 May, and seen 19 Oct. 1945. PYx.

Mourning Dove (*Zenaida macroura*). Several hundred seen flying to and from Conejo Well on 26 and 27 May 1988. PYCx.

Great Horned Owl (*Bubo virginianus*). One heard calling at dawn on 27 May 1988. PYCx.

Long-eared Owl (*Asio otus*). Seen 19 Feb (year?) at 1370 m (Rainey and Loomis, in Miller and Stebbins 1964). P.

Lesser Nighthawk (*Chordeiles acutipennis*). Seen at dusk on 26 May 1988. YCx.

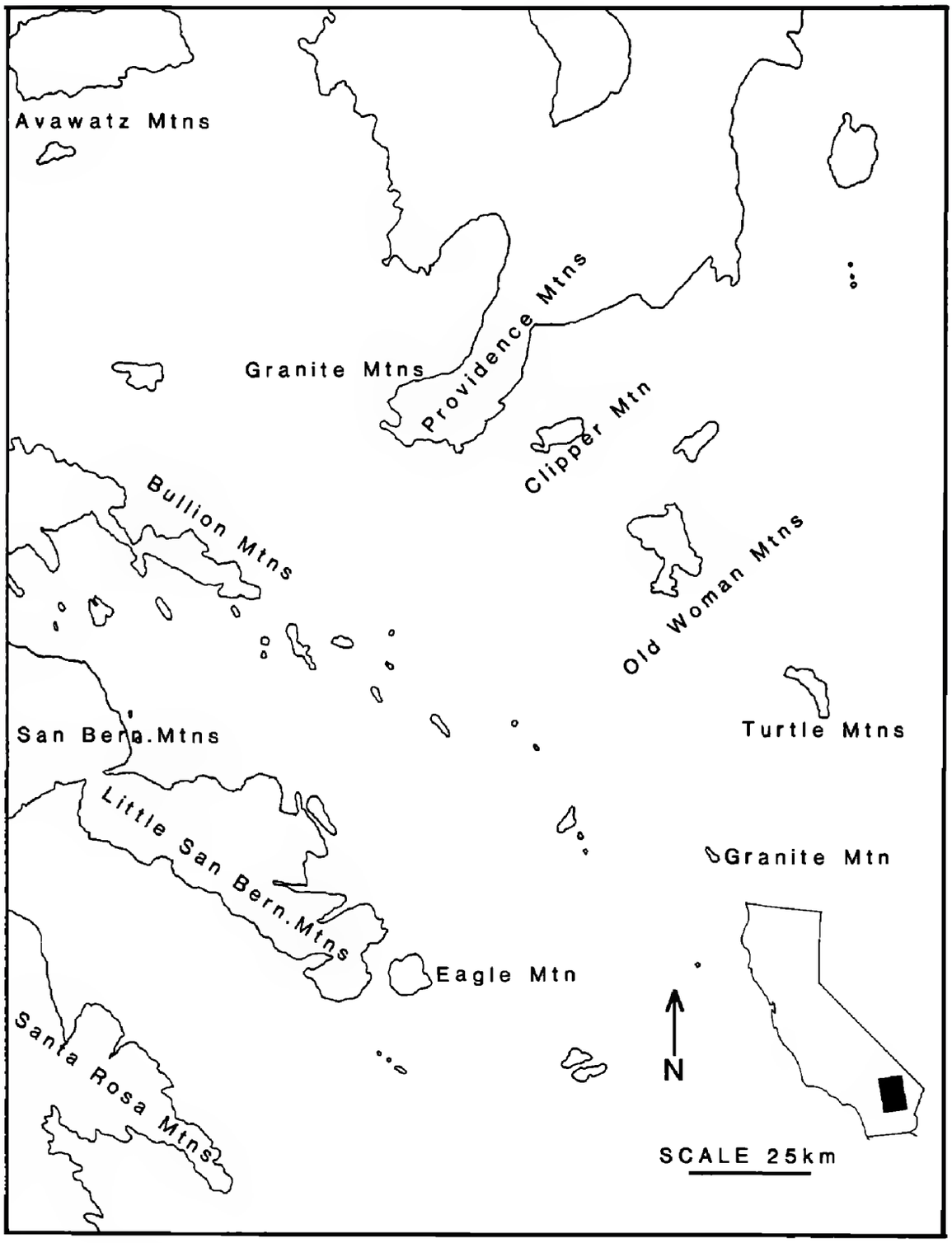

Figure 1. Topography of the southern Mojave Desert. The 1000 m contour line is shown. The black rectangle on the inset map of California shows the approximate area covered by the map.

White-throated Swift (*Aeronautes saxatalis*). Seen 19-20 Oct 1945, 13-14 May 1987, 14-15 Mar, and 26-27 May 1988, with the recent records being of groups of 5-20 individuals. Several times, especially on 26 May 1988, seen entering cavities on cliffs which may have been nest sites. PYCx.

Anna's Hummingbird (*Calypte anna*). Collected 20 Oct and seen 21 Oct 1945, 17 Mar 1986, 13 May 1987, and 26-27 May 1988. Abundant 26-27 May 1988, with many aggressive encounters observed, but only one of >50 individuals had a gorget; two others had a few dark feathers on their throats.

Costa's Hummingbird (*C. costae*). Seen 17 Mar 1986 at west base of mountain. PYCx.

Acorn Woodpecker (*Melanerpes formicivorus*). An apparently immature vagrant of the Arizona form (*M. f. aculeatus*) collected 19 Oct 1945 (Miller 1947).

Ladder-backed Woodpecker (*Picoides scalaris*). Seen 19 Oct 1945, 17 Mar 1986, and single individuals seen 13 May 1987 and 26 May 1988. PYx.

Northern (Red-shafted) Flicker (*Colaptes auratus*). Seen 19-21 Oct 1945.

Western Wood-Pewee (*Contopus sordidulus*). Seen 14 May 1945.

Western Flycatcher (*Empidonax difficilis*). One individual seen on 13 May 1987; abundant 26-27 May 1988. None heard calling, so all probably represent migrants.

Say's Phoebe (*Sayornis saya*). Seen 17 Mar 1986 at west base of mountain. PYCx.

Ash-throated Flycatcher (*Myiarchus cinerascens*). Seen 17 Mar 1986 at base of mountain. PYCx.

Western Kingbird (*Tyrannus verticalis*). Three individuals seen 26-27 May 1988. PYCx.

Violet-green Swallow (*Tachycineta thalassina*). Seen 19-20 May 1945.

Scrub Jay (*Aphelocoma coerulescens*). Collected on 16 May, 19 and 20 Oct 1945. On 16 May 1945, a brood of fledglings was observed. One to five individuals seen 13 May 1987 and 14-15 Mar 1988. P*.

Common Raven (*Corvus corax*). Single individuals heard over peak on 13 May 1987, 14 Mar, and 26 May 1988. PYCx.

Mountain Chickadee (*Parus gambeli*). Seen Nov 1986.

Bushtit (*Psaltriparus minimus*). Collected 16, 19-21 May 1945, and observed several times daily 13-14 May 1987, 14-15 Mar and 26-27 May 1988. P*.

Cactus Wren (*Campylorhynchus brunneicapillus*). Seen 18-21 Oct 1945, and commonly at base of mountain 13-14 May 1987 (nest found), 14 Mar and 26-27 May 1988. PYC*.

Rock Wren (*Salpinctes obsoletus*). Seen 20-21 Oct 1945, 17 Mar 1986. PYCx.

Canyon Wren (*Catherpes mexicanus*). Seen 19 Oct and collected 20 and 21 Oct 1945; seen commonly 17 Mar 1986, 13-14 May 1987, 14 Mar and 26-27 May 1988. PYx.

Bewick's Wren (*Thryomanes bewickii*). Collected on 16 May and 18-21 Oct 1945; seen commonly 13-14 May 1987, 14-15 Mar, and 26-27 May 1988. Recently fledged young found 16 May 1945. PY*.

Ruby-crowned Kinglet (*Regulus calendula*). Seen 19 Oct 1945, 17 Mar 1986.

Blue-gray Gnatcatcher (*Polioptila caerulea*). Seen 16 May 1945, and commonly 13-14 May 1987, 14-15 Mar, and 26-27 May 1988, apparently on territories. PYx.

Townsend's Solitare (*Myadestes townsendi*). Seen 19 Oct 1945.

Hermit Thrush (*Catharus guttatus*). Seen 19 Oct and collected 20 Oct 1945.

Northern Mockingbird (*Mimus polyglottos*). Seen singing 17 Mar 1986 at west base of mountain. PYCx.

Cedar Waxwing (*Bombycilla cedrorum*). Seen 19-20 Oct 1945.

Phainopepla (*Phainopepla nitens*). Seen near base of mountain 17 Mar 1986, 13 May 1987 (1). Several pairs on territories above 1370 m 26-27 May 1988. Nest with 3 eggs found 26 May 1988. YC*.

Loggerhead Shrike (*Lanius ludovicianus*). Seen 16 May and 18-20 Oct and collected 21 Oct 1945, 17 Mar 1986. Bird with dependent young noted on 16 May 1945. PYC*.

Gray Vireo (*Vireo vicinior*). Seen 13 May 1987. P.

Solitary Vireo (*V. solitarius*). Seen 16 May 1945.

Hutton's Vireo (*V. huttoni*). Collected 20 Oct 1945 at 1450 m.

Warbling Vireo (*V. gilvus*). Collected 20 Oct 1945.

Orange-crowned Warbler (*Vermivora celata*). Seen 16 May 1945, 17 Mar 1986.

Yellow-rumped Warbler (*Dendroica coronata*). Seen 19 Oct 1945, 17 Mar 1986.

Black-throated Gray Warbler (*D. nigrescens*). Seen 20 Oct 1945.

Townsend's Warbler (*D. townsendi*). Seen 16 May 1945.

Hermit Warbler (*D. occidentalis*). Male seen 13 May 1987.

Wilson's Warbler (*Wilsonia pusilla*). Seen 16 May 1945 and 13 May 1988, the latter sighting of a single individual in the dense willows at Conejo Well.

Western Tanager (*Piranga ludoviciana*). Seen 16 May 1945.

Black-headed Grosbeak (*Pheucticus melanocephalus*). Seen 16 May 1945.

Lazuli Bunting (*Passerina amoena*). Seen 16 May 1945.

Green-tailed Towhee (*Pipilo chlorurus*). Seen 16 May 1945.

Rufous-sided Towhee (*P. erythrophthalmus*). Collected 16 May and 19 Oct 1945. The May specimen had an enlarged oviduct and brood patch. P*.

Black-chinned Sparrow (*Spizella atrogularis*). Collected 16 May 1945, testes 3 mm. Px.

Black-throated Sparrow (*Amphispiza bilineata*). Seen 16 May, 18-21 Oct 1945, and commonly 13-14 May 1987. Nest with downy young found 16 May 1945. PYC*.

Fox Sparrow (*Passerella iliaca*). Seen 19-21 Oct 1945.

White-crowned Sparrow (*Zonotrichia leucophrys*). Seen 15, 18-19 Oct 1945.

Dark-eyed Junco (*Junco hyemalis*). Seen 20 Oct and collected 19 and 21 Oct 1945.

Northern (Bullock's) Oriole (*Icterus galbula*). Seen 17 Mar 1986 at west base of mountain.

Scott's Oriole (*I. parisorum*). Several apparently territorial males seen 13 May 1987 and 26-27 May 1988. PYx.

Cassin's Finch (*Carpodacus cassinii*). Seen 19-20 Oct 1945.

House Finch (*C. mexicanus*). Seen 18-21 Oct 1945, 13-14 May 1987, 14-15 Mar and 26-27 May 1988. Several males singing 26-27 May 1988. PYCx.

Lesser Goldfinch (*Carduelis psaltria*). Seen 19 Oct 1945; pairs seen at west base on 17 Mar 1986; several flocks of 5-10 individuals seen 26-27 May 1988. PYx.

Lawrence's Goldfinch (*C. lawrencei*). Seen 19-20 Oct 1945. PY.

DISCUSSION

Sixty-two species have been recorded on Eagle Mountain. Of these, 30 are known or presumed to breed. Eagle Mountain constitutes the southeastern limit of the ranges of several species in southern California, including the Mountain Quail, Scrub Jay, Bushtit, and Rufous-sided Towhee. Except for the quail, all of these species are represented in the mountains of the Great Basin, the southwesternmost limit of which is about 117 km north in the Providence Mountains (Figure 1; Johnson et al. 1948).

Because Miller's and my visits to Eagle Mountain were brief, it is difficult to draw conclusions about temporal changes in the avifauna (e.g., Johnson 1974). Presences and absences of several species (e.g., Scott's Oriole in 1945, and Black-chinned Sparrow in 1987–88) are suggestive of colonizations and local extinctions, but given high year-to-year fluctuations in numbers of these two species (R. McKernan pers. comm.), their significance is difficult to assess. In the discussion that follows, I ignore temporal changes in the avifauna, thus potentially *overestimating* the number of species breeding on the mountain.

A comparison of the bird fauna of Eagle Mountain with that of the Little San Bernardino Mountains (Miller and Stebbins 1964) shows that several species breeding in the Little San Bernardino Mountains are either absent or probably not breeding on Eagle Mountain (Table 1). The habitat classifications of Miller and Stebbins (1964) provide insight into these distribution patterns. Seven of nine species (all except American Kestrel, *Falco sparverius*, and Lawrence's Goldfinch) inhabiting both pinyon and yucca habitats in the Little San Bernardino Mountains (Miller and Stebbins 1964) probably breed on Eagle Mountain. (American Kestrels have been observed within 20 km of Eagle Mountain, *fide* George San Miguel.).

In contrast, of the nine species restricted to pinyon habitats in the Little San Bernardino Mountains (Miller and Stebbins 1964), only four are known or presumed to breed on Eagle Mountain. Two others have been observed as migrants or winter visitors, and three have not been observed on Eagle Mountain (Table 1). That Gray Vireos and Long-eared Owls do not breed on Eagle Mountain seems probable, given the amount of habitat searched during my last two visits, which were early and late in the breeding season. I am confident that Pinyon Jays (*Gymnorhinus cyanocephalus*), Plain Titmice, and California Thrashers (*Toxostoma redivivum*) are absent, given that all three species are conspicious and vocal when they are present.

Thus, only 44–67% of the pinyon-restricted bird species of the Little San Bernardino Mountains breed on Eagle Mountain. The proportion of species breeding in the Little San Bernardino Mountains but absent on Eagle Mountain differs significantly (binomial test, $P < 0.05$) between habitat-restricted (pinyon habitats only) and less restricted (pinyon and yucca habitats) species. This result indicates that species of higher-elevation habitats are less likely to be present in the peripheral habitat island on Eagle Mountain. Mammals and reptiles appear to show similar patterns of absence of pinyon-restricted species on Eagle Mountain (Miller and Stebbins 1964).

It is interesting, however, that species restricted to woodland habitats to the west and east (Long-eared Owl, Gray Vireo, Acorn Woodpecker, see Miller

Table 1 Occurrences of Bird Species Restricted to Pinyon or Yucca Habitats in the Little San Bernardino Mountains and on Eagle Mountain[a]

Species	Little San Bernardino Mtns	Eagle Mountain
Pinyon Woodland Only (P)		
Long-eared Owl	•	+
Scrub Jay	•	•
Pinyon Jay	•	0
Plain Titmouse	•	0
Bushtit	•	x
California Thrasher	•	0
Gray Vireo	•	+
Rufous-sided Towhee	•	•
Black-chinned Sparrow	•	x
Pinyon Woodland or Yucca Habitats (PY)		
American Kestrel	•	0
Mountain Quail	•	x
Ladder-backed Woodpecker	•	x
Canyon Wren	•	x
Bewick's Wren	•	x
Blue-gray Gnatcatcher	•	x
Scott's Oriole	•	x
Lesser Goldfinch	•	x
Lawrence's Goldfinch	•	+

[a] •, breeding; x, present and probably breeding; +, present but probably not breeding; 0, absent.

1947) have been recorded on Eagle Mountain as migrants, vagrants, or winter visitors. Opportunities for these species to colonize the limited habitat on Eagle Mountain therefore do occur, but either the habitat is too sparse or numbers of these species reaching Eagle Mountain are insufficient for successful colonization.

It appears that gene flow from the Great Basin does occur. Of the four pinyon-restricted species that breed on Eagle Mountain, Miller and associates collected series of two species: three Scrub Jays and 15 Bushtits. The three Scrub Jay specimens and one from northernmost Baja California Norte, Mexico, were described as a race *cana*, distinct from the coastal *obscura* in having the blue lighter and grayer throughout, the back lighter and grayer brown, and the belly somewhat grayer (Pitelka 1951). On the basis of the specimens then in existence from the Little San Bernardino Mountains, Pitelka suggested that the resemblance between *cana* and the race of the Great Basin, *nevadae*, was due to similar selective regimes imposed by life at the edge of the desert. However, on the basis of one specimen of *nevadae* and two apparent *obscura* × *nevadae* hybrids in a series of 66 collected from the Little San Bernardino Mountains in the 1960s (CSULB), I believe that

cana reflects genetic interaction of *obscura* with *nevadae*, in spite of the wide expanse of desert separating them (Peterson unpubl.).

In Bushtits, 12 of 15 individuals collected on Eagle Mountain belong to the race *sociabilis*, which is endemic to the Monument. The remaining three individuals, however, have the gray pileum characteristic of the Great Basin race *providentialis*, and probably represent intergrades or immigrants (Miller 1946).

In Bewick's Wrens (not pinyon-restricted), specimens from the Little San Bernardino Mountains and the Eagle Mountains show wide variation in back color, from the dark brown of the coastal race, *correctus*, to the pale gray of the race in the Providence Mountains, *eremophilus*. However, intrapopulation variability is sufficiently great that definite conclusions cannot be made (Miller and Stebbins 1964).

Three hypotheses were presented above to account for the differentiation of four subspecific forms in the Little San Bernardino and Eagle mountains. The isolation provided by the peninsular geographic situation may well be important in maintaining the integrity of the differentiated forms. However, in at least two of the species (Bushtit and Scrub Jay), evidence exists for genetic influence from the east. The Scrub Jay population in the Eagle Mountains appears to have originated by hybridization between coastal and interior populations. Thus, either historical or current gene flow (Hypotheses 3 and 2, respectively) may well be important in the differentiation of the desert-edge forms in Joshua Tree National Monument.

SUMMARY

Sixty-two species of birds have been recorded on Eagle Mountain, an island of pinyon woodland in Joshua Tree National Monument, Riverside County, California. Several species breeding in the nearby Little San Bernardino Mountains do not breed on Eagle Mountain, but vagrants of these species occasionally visit there. Although the avifauna of Eagle Mountain is most closely allied to the avifaunas of regions to the west, evidence exists for gene flow or historical influence from the east in three species. Similar avifaunal surveys and collections are badly needed from other small mountain ranges to the east, which may serve as stepping stones across the Mojave Desert.

ACKNOWLEDGMENTS

Many thanks to the staff of Joshua Tree National Monument, especially Bob Moon and Mark Heuston, for making my work on Eagle Mountain possible. Thanks to Amy Peterson, Lloyd Kiff, Manuel Marin, Dale Clayton, and Bill Schew, for companionship and assistance in the field under difficult conditions. Thanks to George San Miguel, Charles Collins, Bob McKernan, and Jon Atwood for information about the Eagle Mountains, and to Bruce Patterson and Lloyd Kiff for critical readings of the manuscript. Bob McKernan, Amadeo Rea, and Philip Unitt provided additional comments on a late draft of the manuscript. Special thanks to Frank Pitelka for advice and interest throughout this study.

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Accepted 13 July 1990

Mountain Quail *Sketch by Narca Moore-Craig*

NOTES

FIRST DOCUMENTED RECORD OF CHUCK-WILLS'S-WIDOW IN NEW MEXICO

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In September or October 1987 I found a Chuck-will's-widow (*Caprimulgus carolinensis*) dead on the campus of Eastern New Mexico University, Portales, Roosevelt County, New Mexico. It was found lying near the base of the university's science hall approximately fifteen yards from South Avenue K. The specimen appeared to have been dead for several hours and was missing all its rectrices. The exact date was lost while the bird was stored in the university's freezer.

The bird was delivered to the Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, where it was prepared as a study skin (CM T-13227) by Stephen M. Rogers. The specimen was an immature male (testes 4 × 5 mm) and had no fat.

The latest check-list of birds in New Mexico shows no prior record of this species in the state (Hubbard 1978). Recently Hubbard (pers. comm.) reaffirmed that no substantiated sightings of Chuck-will's-widow had previously been made in New Mexico. The only previous mention of the species in the state is the undocumented statement by McCall (1851:215) that "a few" were met with in New Mexico in June and July 1850. Hubbard (pers. comm.) indicated this is one of several species apparently misidentified by McCall in his list of New Mexico birds.

The Chuck-will's-widow's breeding range extends as far west as central Kansas, central Oklahoma, and central Texas. (Johnsgard 1979, Oberholser 1974, AOU 1983). Sutton (1967) recorded a calling Chuck-will's-widow on 2 September 1963 in Cimmaron County, extreme western Oklahoma.

Three far western specimens of the Chuck-will's-widow have been recorded in recent years. The first was found on the Desert Wildlife Range, Clark County, Nevada, under a telephone line, 12 June 1984 (Kingery 1984); the second was found 16 October 1986 at Half Moon Bay, San Mateo County, California (Bailey 1989); the third was dead on a road near Loleta, Humboldt County, California, on 4 January 1989 (Harris and Hawkins 1990).

I thank Kenneth E. Parkes, James M. Loughlin, Scott D. Wood, and Stephen M. Rogers of the Carnegie Museum of Natural History for their help in identifying the specimen and in the preparation of the manuscript. I thank John P. Hubbard, New Mexico Department of Game and Fish, for providing information on the status of the species in New Mexico.

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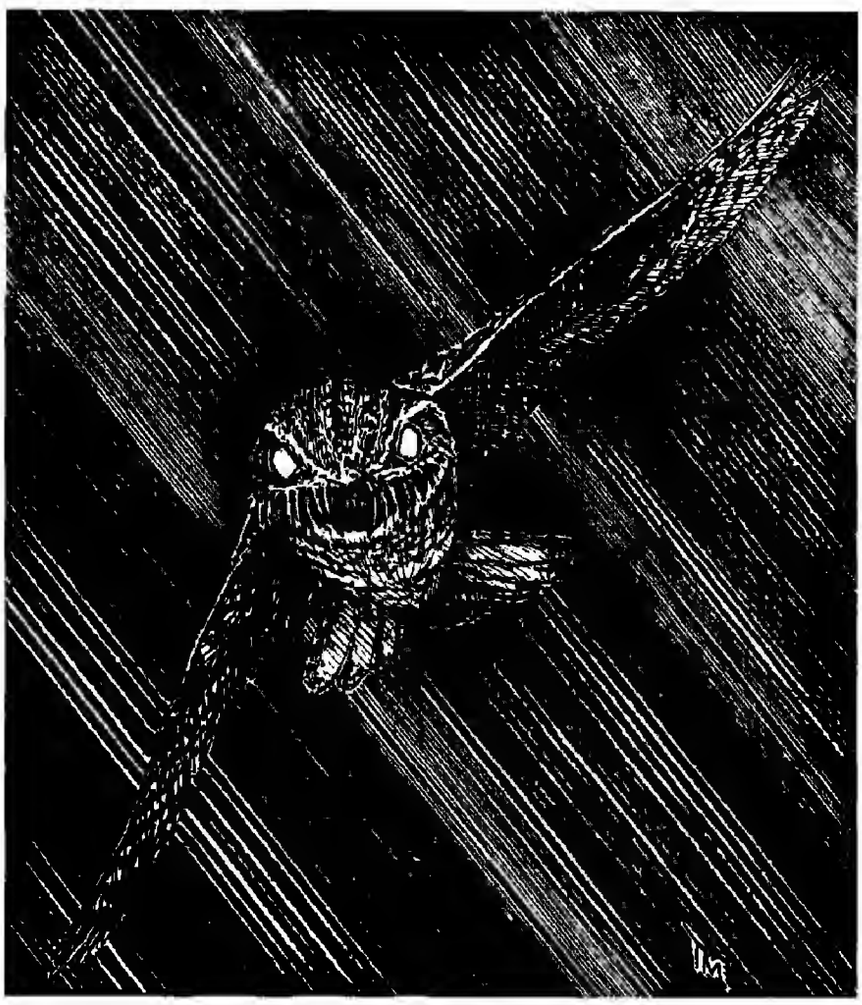
Accepted 14 August 1990



Chuck-will's-widow *Sketch by Tim Manolis*

A SECOND WEDGE-TAILED SHEARWATER IN CALIFORNIA

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On 31 July 1988 we started a day of birding at the mouth of the Whitewater River at the north end of the Salton Sea, Riverside County. At about 0630 we waded across the rivermouth to check the area to the west of the river. When partially across the river we stopped on an exposed sandbar and looked over the open water to the south. Almost immediately Webster spotted a procellariiform flying toward us from the southwest and pointed it out to McCaskie. As we watched the bird flying toward us we initially considered the Flesh-footed Shearwater (*Puffinus carneipes*) since the uniform dark coloration of the bird, along with its slow manner of flight, closely matched that species. However, as the bird got closer it became clear that the bill was dark, eliminating the possibility of a Flesh-footed Shearwater. In addition, our brief views of the tail left us both with the impression that the bird had an unusually long tail for a shearwater, leading Webster to suggest it might be a Wedge-tailed Shearwater (*Puffinus pacificus*). The bird continued to fly toward us, giving us time to consider the Sooty Shearwater (*Puffinus griseus*) and eliminate that species as a possibility. When about 100 yards to the southwest of us it landed on the water among a small group of gulls, giving us an ideal opportunity to study it carefully while commenting on the shape and coloration of the bill, the coloration of the head and breast, the apparent patterning on the upperparts, the protrusion of the tip of the tail beyond the tips of the folded wings, and the coloration on the underwings on the one occasion it flapped its wings while swimming.

At this point we were convinced the bird was a dark-morph Wedge-tailed Shearwater. Webster went back to the car for his camera while McCaskie kept an eye on the bird. During Webster's absence the bird did much bathing and preening. At one point while the shearwater was preening its tail, it raised its tail upward and partially spread it, clearly showing it to be pointed at the tip. The central tail feathers were noticeably longer than the outer tail feathers, giving the tail a shape similar to that of a booby's.

Just as Webster was returning the shearwater jumped into flight, allowing McCaskie to see the feet and legs. Initially the bird flew off toward the southwest, then turned to the north and swung back toward us. The bird followed the shoreline, heading directly toward us from the west, passing within 100 feet of us, and continued along the shoreline to east of the rivermouth. Then it turned south and flew out over the open water of the Salton Sea, disappearing from sight. We had the bird under observation for between 20 and 30 minutes. While the shearwater was flying toward and past us, Webster took nine photographs, one of which has been published (*American Birds* 42:1225, 1988). Together the photographs clearly show the bird to be a large dark shearwater with a long tail and wings held flexed at the wrists. One of the photographs shows the bill to be a grayish with a dark tip. Webster immediately departed to spread the word of our discovery. Birders were at the mouth of the Whitewater River from about 1030 to dark on 31 July, and again during the first half of the morning on 1 August, but without seeing the shearwater.

The Wedge-tailed Shearwater was a uniform brown, noticeably paler than a Flesh-footed Shearwater, with the dark eye being a noticeable feature of the face, and the color of the underwings most like that on the underwings of the darker Short-tailed Shearwaters (*Puffinus tenuirostris*). When the bird was sitting on the water we were able to see that the back and scapular feathers were fringed with lighter brown, creating a scaled pattern. This feature was not prominent, however, and not evident when we were observing the bird in flight. The tip of the tail protruded an inch or so

beyond the tips of the primaries on the folded wings. The bill was long and narrow like that of other shearwaters, being a dark blue-gray with a blackish tip. The feet and legs were entirely pink.

In flight the Wedge-tailed Shearwater had the long-winged profile of a Buller's Shearwater (*Puffinus bulleri*) but an even longer tail. The bird flew with slow wingbeats and much gliding, the wings held bowed downward but with a kink at the carpal joint like that on a frigatebird. The feathers on the wings, especially the secondaries, appeared worn. A study of the photographs shows the bird was molting primaries.

A light-morph Wedge-tailed Shearwater photographed about 4 miles off Point Pinos, Monterey County, California, on 31 August 1986 (Stallcup et al. 1988) represents the only previous recorded occurrence of this species in North America. The Wedge-tailed Shearwater inhabits the warm waters of the Pacific and Indian oceans, its closest approach to California being along the west coast of Mexico. King (1974) showed Wedge-tailed Shearwaters occurring off western Mexico north to near the southern tip of Baja California. In addition, King found relatively large numbers of dark-morph Wedge-tailed Shearwaters off western Mexico in July. Pitman (1986) also showed Wedge-tailed Shearwaters ranging as far north as off the coast of Nayarit, near the mouth of the Gulf of California.

This is not the first time a procellariiform has reached the Salton Sea, there being previous recorded occurrences of the Laysan Albatross (*Diomedea immutabilis*), Cook's Petrel (*Pterodroma cookii*), Buller's Shearwater, Sooty Shearwater, Leach's Storm-Petrel (*Oceanodroma leucorhoa*), Black Storm-Petrel (*Oceanodroma melania*), and Least Storm-Petrel (*Oceanodroma microsoma*). The appearance of the Least Storm-Petrels and one of the Leach's Storm-Petrels was associated with Hurricane Kathleen's passage through the area on 10 September 1976. However, all other occurrences of procellariforms appear unrelated to storms, the birds being found during calm conditions and suspected of reaching the area by way of the Gulf of California. We suspect the Wedge-tailed Shearwater seen at the north end of the Salton Sea on 31 July 1988 also reached this area by way of the Gulf of California, by entering the Gulf from the waters off Nayarit, moving north to the head of the Gulf, and across the 200 miles of flat land separating the Salton Sea from the Gulf.

This record (150-1988) was reviewed by the California Bird Records Committee and received a unanimous endorsement. The record, including the nine photographs taken by Webster, is now on file at the Western Foundation of Vertebrate Zoology, Los Angeles.

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Accepted 21 August 1990

Wedge-tailed Shearwater off Woolongong, N.S.W. Australia, November 1986

Photo by Bruce Webb

Volume 21, Number 3, 1990

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Cover photo by Rich Stallcup of Inverness, California: First winter Broad-winged Hawk (*Buteo platypterus*), Inverness, California.

Western Birds solicits papers that are both useful to and understandable by amateur field ornithologists and also contribute significantly to scientific literature. The journal welcomes contributions from both professionals and amateurs. Appropriate topics include distribution, migration, status, identification, geographic variation, conservation, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, and techniques for censusing, sound recording, and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are reports of studies done in or bearing on the Rocky Mountain and Pacific states and provinces, including Alaska and Hawaii, western Texas, northwestern Mexico, and the northeastern Pacific Ocean.

Send manuscripts to Philip Unitt, 3411 Felton Street, San Diego, CA 92104. For matter of style consult the *Suggestions to Contributors to Western Birds* (8 pages available at no cost from the editor) and the *Council of Biology Editors Style Manual* (available for $24 from the Council of Biology Editors, Inc., 9650 Rockville Pike, Bethesda, MD 20814.

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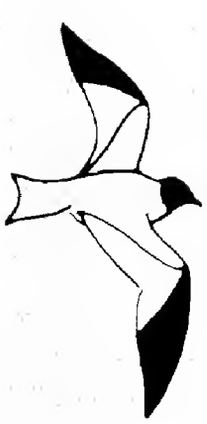

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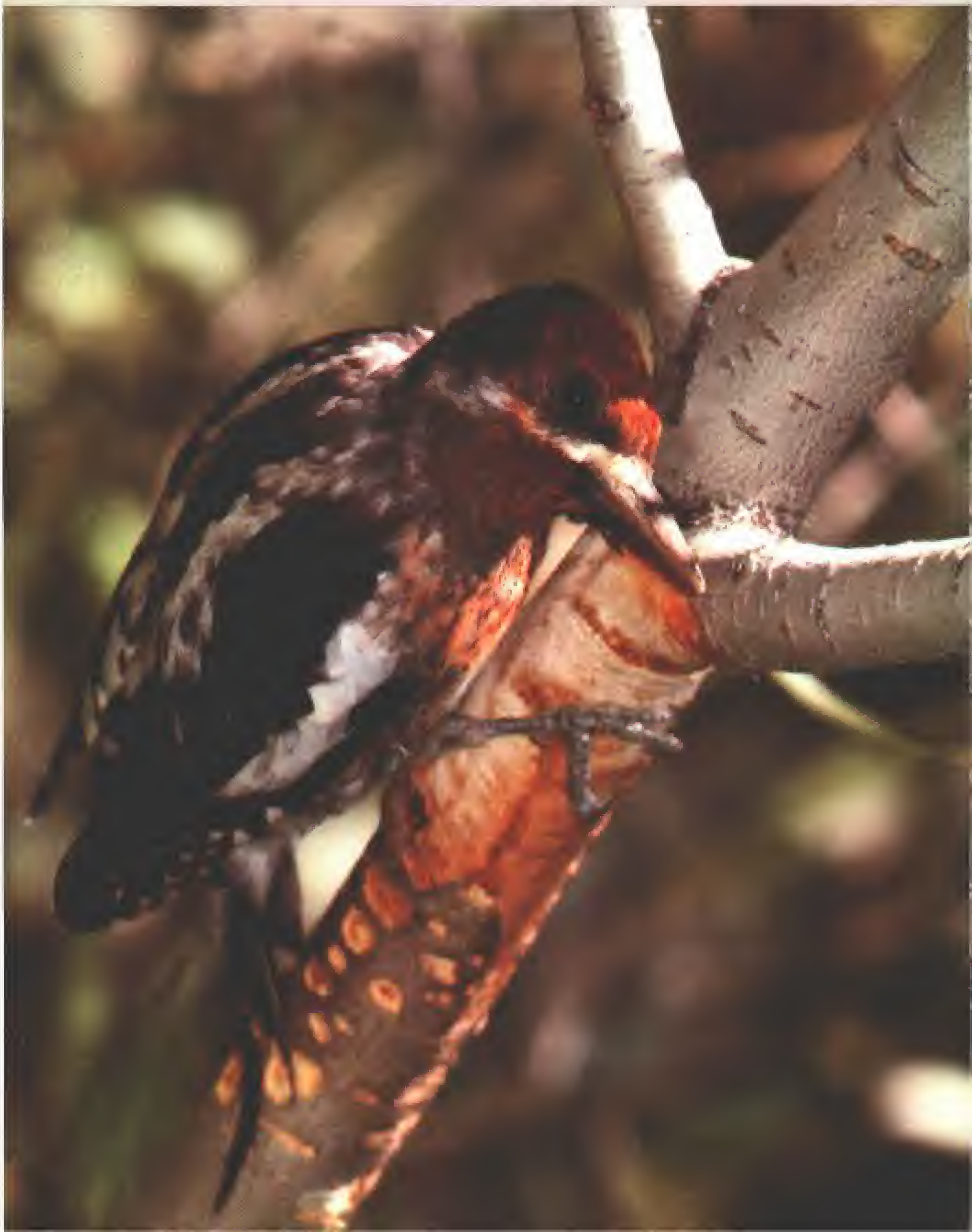

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Quarterly Journal of Western Field Ornithologists

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Published May 1, 1991 ISSN 0045-3897

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Full page	4 x 6¾ inches	$60 per issue	$200 per year
Half Page	4 x 3⅜ inches	$40 per issue	$130 per year
Quarter Page	4 x 1 11/16 inches	$30 per issue	$110 per year

Offset printing, one column per page, 4 inches wide. Glossy, black and white photos are acceptable; half-tone screen size: 133 line. Photo-ready copy is requested. If this is not possible, extra charges for typesetting will be made as follows: $15 full page, $10 half page, $5 quarter page. Send copy with remittance to the Treasurer. Make checks payable to Western Field Ornithologists. A 15% commission is allowed for agencies.

WESTERN BIRDS

Volume 21, Number 4, 1990

ELEVENTH REPORT OF THE CALIFORNIA BIRD RECORDS COMMITTEE

LOUIS R. BEVIER, P.O. Box 665, Storrs, Connecticut 06268

This report contains 257 records reviewed by the California Bird Records Committee (hereafter the Committee) and is the largest of the eleven reports compiled thus far. A total of 81 species is covered as follows: 234 records of 73 species accepted and 23 records of 20 species not accepted. Thus, 91% of the reports are accepted. The rate of acceptance in the last four Committee reports has varied from 88% to 92%, whereas in previous reports the rate has been as low as 74% and as high as 97%. The records dealt with here span 90 years from 1896 to 1986 and include reports for almost every year from 1960 onward. Over half of the records, however, are from the last two years of that period (99 for 1985 and 40 for 1986).

Half of the counties in California are represented in this report, including all but two of the coastal counties. Of these, San Diego and San Francisco counties have 40 and 37 accepted records, respectively; these numbers are slightly over twice the next highest totals of 17 and 16 for Santa Barbara and San Luis Obispo counties, respectively. The largest number of rarities per land area goes to Southeast Farallon Island, which has 15% of the accepted records (a total of 35) and only one ten-thousandth of one percent of California's total land area. The quality and consistency of the reports from there has recently been among the highest that the Committee reviews. Special recognition for this goes to Peter Pyle, Dave DeSante, and the Point Reyes Bird Observatory.

Three species are added to the state list in this report: Wedge-tailed Shearwater, Ruddy Ground-Dove, and Three-toed Woodpecker. These decisions and other recent decisions (Roberson 1990) place the total number of bird species recorded in California at 572. In addition, the earliest records for the state are accepted for four species: Anhinga, Common Black-headed Gull, Yellow-throated Vireo, and Pine Warbler.

PROCEDURES

In evaluating a submitted report, members of the Committee assess the adequacy of the evidence supplied—written, photographic, and otherwise. The Committee can neither verify nor invalidate records, but can provide a judgment on the acceptability of the report for the permanent historical record that is maintained. Observers whose reports are not accepted by the Committee should not take this to mean that the bird or birds were misidentified or that the observer's abilities are questioned. Cases in which the Committee is convinced of an error are rare, and the majority of unaccepted reports involve a lack of adequate documentation. It is the accuracy and completeness of the field report and the rigor and objectivity of the review procedure that distinguishes an accepted record from an uncorroborated report.

One of the major aims underlying the establishment of the Committee was to foster an awareness in California's field ornithologists of the importance of providing corroboration for reports of rarities. Careful field notes, sketches, photographs, and sound recordings are essential to establishing a record of lasting ornithological value. In most cases the best evidence for the occurrence of a bird species in the state is a specimen, but current constraints against collecting, coupled with the improvement of photographic and recording equipment and the sharpening of field skills have given rise to the need for procedures for evaluating and preserving this evidence, in much the way museum collections allow for the evaluation and preservation of specimens. This means that careful attention must be paid to acquiring all the necessary details for identification at the time of the observation and that a cautious approach must be used for evaluating the evidence.

When reviewing the documentation of a rarity, the Committee attempts to eliminate all other possible species from consideration. Therefore, it is important for the observer to document the presence of characters that exclude other similar species. In fact, a thorough description may sometimes include critical field marks that distinguish the species from others not considered at the time of the observation. By relying only on characters that support an identification and that fail to reject other species, including those sometimes ignored, one risks making a misidentification. Two examples of this type of error involved some extraordinary rarities, the circumstances of which are well worth reviewing—see Morlan and Erickson (1983) regarding a Eurasian Skylark (*Alauda arvensis*) that was identified by many as a Smith's Longspur (*Calcarius pictus*) and Abbott and Finch (1978) regarding a Variegated Flycatcher (*Empidonomus varius*) that many labeled as a Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*). To persons using these records in their research, it should be said that the Committee strives to evaluate reports in this fashion but is not infallible. In addition, questions involving the natural occurrence of a bird cannot be assessed by a similar method whereby all possible explanations are eliminated. It is extraordinarily difficult, if not impossible, to prove that a bird did not escape from a cage or was not purposely transported into the state. To help document such rarities, the reporter should supply the Committee with information on the

captive status and likelihood of vagrancy for the species as well as justifying its identification. In such cases, the Committee's decisions represent a collective opinion based on the information available. (See Anhinga, Ruddy Ground-Dove, and Barnacle Goose in this report.)

The purposes and procedures of the Committee have been published in its bylaws (Western Birds 8:161-165, 1977) and updated periodically in some of its reports (Binford 1983, 1985). The current membership of the Committee, recent changes in policy and practices, and the list of reviewed species were published most recently by Roberson (1990). Please note the removal from the review list of Cook's Petrel, *Pterodroma* petrels identified only as the subgenus *Cookilaria*, Wilson's Storm-Petrel, Barred Owl, and Prothonotary Warbler. Also, the Committee is now soliciting reports of Tricolored Heron occurring after 1 January 1990. Send all rarities reports directly to the secretary, Michael A. Patten, P.O. Box 8612, Riverside, CA 92515. The Western Foundation of Vertebrate Zoology (1100 Glendon Avenue, Los Angeles, CA 90024) continues to maintain the archive of all published records. All voice recordings are housed at the California Academy of Sciences, Department of Ornithology and Mammalogy, Golden Gate Park, San Francisco, CA 94118.

FORMAT

The organization and style of this report are similar to those used in the tenth report (Dunn 1988). The systematic lists for accepted and unaccepted records follow the AOU Check-list (1983) and its supplements (AOU 1985, 1987, 1989). The number after each species' name represents the total accepted records for California. Two asterisks following this number mean that the total reported covers only the period of years for which the species is reviewed or that reports not formally accepted are added to the total (see Roberson 1986). Species marked with a single asterisk are no longer reviewed by the Committee.

Within each species account, records are listed chronologically according to the first known date of occurrence. Each record presents in order as much of the following information as possible: number of birds, age, sex, locality, county, date or complete date span, and, in parentheses, initials of contributing observers, repository of specimens, and the official record number. The diagnosis of age and sex is my own opinion based on evidence in the files and comments by other Committee members; annotations on subspecific identification are handled in the same way. Designations for either category are made only when supported by the evidence available. The initials of the contributing observers are listed in alphabetical sequence by name; if the observer or observers first finding or identifying the bird submitted documentation, then their initials are placed first and separated from the others by a semicolon. Observers who submitted a photograph have a dagger (†) following their initials. Photographs greatly assist in the review procedure, and their submission with the written report is strongly encouraged. As in previous reports, I have attempted to provide the full date span for records. The seasonal reports of *American Birds* and its predecessor *Audubon Field Notes* are the primary source for these dates,

but where I have given a revised date, it is italicized. These revised dates are considered correct by the Committee.

Decisions regarding the number of individuals involved, especially when the species returns to the same locality annually, are made by a consensus of the Committee. An individual judged as the same or probably the same as a previous bird is not counted in the total of accepted records, whereas an individual considered not the same or possibly the same is added to the total. These decisions are rarely based on firm evidence, such as a uniquely banded bird, but are the considered opinions of the Committee members based on their experience and the evidence available.

ABBREVIATIONS

The Committee has adopted the following abbreviations for counties cited in this report: ALA, Alameda; BUT, Butte; CC, Contra Costa; COL, Colusa; DN, Del Norte; GLE, Glenn; HUM, Humboldt; IMP, Imperial; INY, Inyo; KER, Kern; LA, Los Angeles; MER, Merced; MNO, Mono; MOD, Modoc; MRN, Marin; MTY, Monterey; ORA, Orange; RIV, Riverside; SBA, Santa Barbara; SBE, San Bernardino; SD, San Diego; SF, San Francisco; SHA, Shasta; SIS, Siskiyou; SJ, San Joaquin; SLO, San Luis Obispo; SM, San Mateo; SCL, Santa Clara; SON, Sonoma; STA, Stanislaus; TUO, Tuolumne; VEN, Ventura.

Museums cited as the repository for a specimen are abbreviated as follows: CAS, California Academy of Sciences; CM-EHS, Clarke Museum, Eureka High School, Eureka; DVNMM, Death Valley National Monument Museum; SDNHM, San Diego Natural History Museum; SFSU, San Francisco State University collection; UCLA, University of California, Los Angeles. Journals cited are spelled out or given the following abbreviations: AmB, *American Birds*; AFN, *Audubon Field Notes*. Parks, refuges, and the like are abbreviated with the following: NF, National Forest; NM, National Monument; NP, National Park; NS, National Seashore; NWR, National Wildlife Refuge.

ACCEPTED RECORDS

YELLOW-BILLED LOON *Gavia adamsii* (33). One was at Pacific Grove, MTY, 22–25 Jan 1969 (AB; LCB; 38-1985). One was at Bodega Bay, SON, 6 Dec 1980 (JWi; 225-1986). One was seen from Fields Landing, Humboldt Bay, HUM, 1 Jan 1981 (RLeV†; 241-1986). One was found on Carmel Bay, MTY, *23* Jan 1982 (KHa; GPo†; 163-1986). An adult in alternate plumage off the south jetty at Humboldt Bay, HUM, *27 Aug*–3 Oct 1982 (RLeV†; 242-1986) represents the earliest record for fall and is only the fourth seen in alternate plumage in California. One was about 3/4 mile southwest of Moss Landing harbor, MTY, 30 Dec 1985–*19 Jan 1986* (SFB†; AB; 6-1986). One immature was observed feeding on Dungeness crab (*Cancer magister*) in the harbor at Eureka, HUM, 25 Apr–18 May 1986 (RAE; GSL, LPL, SS†; 283-1986); this is the latest spring occurrence of any Yellow-billed Loon in California.

The Pacific Grove bird was published as an adult (AmB 23:514), but the description does not support any conclusion as to age; from records of birds of known age, an immature is much more likely. Both Remsen and Binford (1975) and Roberson

(1985) published this bird as present through 26 Jan, which is incorrect. The Carmel Bay bird was published by Roberson (1985) incorrectly as off Asilomar on 17 Jan 1982; this same error was published in *The Gull* 64:52 and AmB 36:325.

SHORT-TAILED ALBATROSS *Diomedea albatrus* (3**). A first-year bird was seen over the west edge of the Cordell Bank, about 25 miles west of Point Reyes, MRN, 3 and 5 Nov 1985 (Figure 1; RS†: SFB, LCB, RAE, WEG†, JSL†, RM†, GMcC, BDP, DR†, RAR†; 142-1985).

Perhaps the most remarkable aspect of this record is that a chartered boat with California's most enthusiastic field ornithologists returned two days after the initial sighting to find the bird within 1/4 mile of where Rich Stallcup had first seen it. At least one photograph shows what appears to be a band on the left foot; this species is banded on Torishima, a small volcanic island 380 miles south of Tokyo, Japan, and the only known breeding locality for this endangered species (Hasegawa and DeGange 1982).

A century ago, the Short-tailed Albatross was not uncommon along the Pacific coast of North America south to Baja California, and first-year birds were then apparently the most frequently encountered age class in the southern part of its range (Anthony 1924). This is the third record for California this century, and all birds have been entirely dark immatures such as this one, although there is a recent report of an adult off Baja California (D. Ainley pers. comm.) and an older report published by Traylor (1950) of an adult off San Francisco in 1946. This latter report was recently reviewed but not accepted by the Committee because the published description,

Figure 1. Short-tailed Albatross, Cordell Bank, about 25 miles west of Point Reyes, Marin Co., 3 November 1985.

Photo by Rich Stallcup

although intriguing, failed to eliminate the Wandering and Royal Albatrosses (*D. exulans* and *epomophora*); this decision will be published in a forthcoming report.

MOTTLED PETREL *Pterodroma inexpectata* (15). Ten were seen 150 to 200 miles southwest of Cape Mendocino, HUM, 20 Apr 1985 (RLP†; 133-1985). Two photographs on file document at least one of these birds.

This record was published by Morlan and Erickson (1988). The species will undoubtedly prove to be regular in these waters.

STREAKED SHEARWATER *Calonectris leucomelas* (4). One was 3.5 miles southwest of Point Pinos, MTY, 22 Sep 1985 (Figure 2; JLD; LJ†; 61-1986). This is only the fourth record for California and North America. A report from Monterey Bay on 14 Oct 1978 has unfortunately still not been submitted for review (AmB 33:209, Roberson 1980, 1985, AOU 1983, Morlan 1985).

WEDGE-TAILED SHEARWATER *Puffinus pacificus* (1). One was 4.5 to 5 miles west of Point Pinos, MTY, 31 Aug 1986 (RS†; RB, BM, NM, PaN, PhN, SP, AKT, KW, WU; 456-1986).

Superbly documented, this sighting establishes the first record for California. Details of the observation along with distributional and identification summaries were published by Stallcup et al. (1988).

*WILSON'S STORM-PETREL *Oceanites oceanicus* (74). Three were on Monterey Bay, MTY, 3 Oct 1970 (GMcC; 133-1986), and one was there 5 Oct 1974 (GMcC; 141-1986). Up to two were seen on four separate days on Monterey Bay, MTY, 31 Aug–6 Oct 1985 (JLD, JML; SFB, MJL, GMcC; 138-1985). At least 45 were seen over the Cordell Bank, about 25 miles west of Point Reyes, MRN, 3–7 Nov 1985 (RS; SFB, LCB, RAE, RM†, GMcC, JM, BDP, DR†; 144-1985) with at least seven on 3 Nov, at least 45 on 5 Nov, and about 15 on 7 Nov.

Figure 2. Streaked Shearwater, Monterey Bay, 3.5 miles southwest of Point Pinos, Monterey Co., 22 September 1985.

Photo by Lars Jonsson

Even by conservative estimates, the numbers over the Cordell Bank are unprecedented for the eastern North Pacific Ocean. The birds on Monterey Bay were more expected, as a few individuals have been found regularly with storm-petrel flocks in fall since 1967. The Committee no longer reviews this species.

BROWN BOOBY *Sula leucogaster* (20). One immature was at Rock Hill, Salton Sea, IMP, 15–*23* Aug 1970 (GMcC; 134-1986). One immature was at the north end of the Salton Sea, RIV, 28 Aug–7 Sep 1971 (GMcC; 136-1986). One sub-adult was near Southeast Farallon Island, SF, 1 Jul 1984 (KFC; HAG, TMcE; 122-1985); this bird and one the previous fall at the Farallones (previously accepted 126-1985, Dunn 1988) are the northernmost records for the Pacific coast of North America.

OLIVACEOUS CORMORANT *Phalacrocorax olivaceus* (3). An adult was seen at the Whitewater River mouth, north end of the Salton Sea, RIV, 23 Mar and 20 Apr 1986 (BEDa; 329-1986) and was seen there again 19 Jul and 23 Aug 1986 (GMcC; 376-1986). This is probably the same individual first found at this locality 1 Aug 1982 and seen intermittently at both ends of the Salton Sea over the next four years (previously accepted 76-1982, 37-1983, Morlan 1985; 66-1983, Roberson 1986; 100-1985, Dunn 1988).

ANHINGA *Anhinga anhinga* (2). An adult female was at Sweetwater Reservoir, SD, 4 Feb 1977–20 Jan 1979 (GMcC†, JVR, DR; 3-1977).

This currently represents the earliest record accepted for California, although an earlier report for 1939 in San Francisco has recently been accepted and will be published in a forthcoming report. Originally submitted in 1978, the current record was reviewed on two circulations and not accepted to the state list on the basis of questionable natural occurrence (Luther et al. 1979). The main points of concern were the exceptionally long period of residence for a vagrant bird and the lack of any pattern of occurrences supporting the likelihood of vagrancy to California. Subsequently, another Anhinga found in the fall of 1983 at Lee Lake, RIV, remained for just over six months and was accepted by the Committee (Roberson 1986). This record, along with information on the recent occurrence of the Anhinga in Sonora, Mexico, and the apparent scarcity of the species in captivity, were the main cause for reconsideration and ultimate acceptance of this older record.

The latest date for this bird is based on the last known report. Unitt (1984) and Garrett and Dunn (1981) gave "fall 1980" as the latest date, but there appears to be no documentation for this date.

REDDISH EGRET *Egretta rufescens* (17). One was at Long Beach, LA, 26 Sep 1980 (JLA; 9-1985). One adult at San Diego Bay, SD, 9 Nov 1985–26 Jan 1986 (GMcC; JML, REW†; 69-1986) was considered the same bird returning for its fourth winter (previously accepted 49-1984, 45-1984, Roberson 1986; 50-1985, Dunn 1988). An immature reported at Seal Beach and Bolsa Chica, ORA, 8 Nov 1980–end of Feb 1981 (AmB 35:225, 335) may have been the same individual at Long Beach accepted above, the first county record for LA. This species is rarely reported north of San Diego Bay.

YELLOW-CROWNED NIGHT-HERON *Nyctanassa violacea* (12). An adult was at Scripps Institute of Oceanography, La Jolla, SD, 19 Aug–9 Oct 1984, again 19–31 Mar 1985, and 5 Dec 1985–28 Feb 1986 (JLD†, JML, MJL, GMcC, REW†; 18-1986). This was judged to be the same individual that had been seen periodically here and at nearby San Elijo Lagoon since 25 Oct 1981 (88-1981, Binford 1985; 81-1982; 36-1983, Morlan 1985; 237-1984, Dunn 1988).

BLACK-BELLIED WHISTLING-DUCK *Dendrocygna autumnalis* (5). Two were near the Salton Sea NWR headquarters, IMP, *29* May–22 Jun 1985 (JML, MJL, GMcC, REW†; 141-1985).

TRUMPETER SWAN *Cygnus buccinator* (7). Four adults wintered with Tundra Swans (*C. columbianus*) near Fort Dick and the Smith River estuary, DN, 2 Dec 1985–14 Mar 1986 (RAE; SFB, ADB, JLD, JML, GSL, MJL, CM, GMcC, JM; 1-1986).

EMPEROR GOOSE *Chen canagica* (37**). One was at the Sacramento NWR, GLE, 11–27 Nov 1960 (GMcC; 93-1986).

TUFTED DUCK *Aythya fuligula* (31). One male was at Tiburon, MRN, 3 Jan 1981 (CB; 91-1986); this is not the same bird that returned to Mill Valley and Richardson Bay, MRN (see Morlan 1985). A male at Lopez Lake, SLO, 17–28 Feb 1981 (CM; 465-1986) probably returned to that locality and was one of two males seen there in early 1986, the first 25 Jan–21 Feb 1986 (TME; JLD†, CM, JEM; 73-1986) and the second 15–16 Feb 1986 (TME; 203-1986). One female was at Arcata, HUM, 22 Nov 1985–1 Feb 1986 (GSL, GMcC, JCS†; 19-1986). A male at Saticoy, VEN, 2–25 Jan 1986 (REW; GMcC; 21-1986) was considered the same as one there the previous winter (42-1985, Dunn 1988). A female was at the same locality 20 Feb 1986 (KTS; 188-1986) and was probably the same bird returning for its second winter (previously accepted 197-1985, Dunn 1988). One male was on the Fall River near Glenburn, SHA, 18 Jan 1986 (REk; 207-1986). A single female was at the San Francisco Zoo, SF, 25 Jan–13 Feb 1986, moving to Golden Gate Park, SF, 24 Feb–4 Mar 1986 (JM; SFB, LE, JMcC†, DGY; 161-1986). One male was at O'Neill Forebay, San Luis Reservoir, MER, 17 Feb 1986 (JKr; 173-1986). Another male was at Arcata Marsh (Lake Arcata), HUM, 13 Apr–3 May 1986 (RAE; 284-1986).

KING EIDER *Somateria spectabilis* (20). An immature male was at Bodega Bay, SON, 17 Sep 1961 (GMcC; 95-1986). One female was near Brooks Island, Richmond, CC, 18 Dec 1983 (GPe, PW; 98-1986); this bird was judged probably the same as one seen at Brooks Island in the summer of 1984 and the fall of 1985 (156-1984, 120-1985, Dunn 1988) and possibly the same as one wintering at Emeryville, ALA, in 1982–1983 (7-1983, Morlan 1985). A female at Morro Bay, SLO, 28 Oct 1985–28 Feb 1986 (TME; JLD, RRH†, P&MC; 72-1986) was judged probably the same as one off nearby Montaña de Oro State Park, SLO, 12 Jan 1986 (TME; 81-1986). One female was at Moss Landing, MTY, *12* Jan 1986 (FRC†; 171-1986). Another female was at Point Saint George, DN, 29–31 Mar 1986 (ADB, SHe; 208-1986). An immature male was at the Salinas River mouth, MTY, 27 Apr–15 Jun 1986 (RFT†, CT, TC; DR; 229-1986).

MISSISSIPPI KITE *Ictinia mississippiensis* (16). One adult was at Furnace Creek Ranch, Death Valley NM, INY, 2–5 Jun 1968 (GMcC; 125-1986); this was the second state record. One immature was at Point Loma, SD, 21 Sep 1985 (GMcC; 67-1986).

The immature seen flying south over Point Loma represents the third fall record for California and the latest by one week; the previous fall records involved one immature and one adult. One member noted that the Plumbeous Kite (*I. plumbea*), which occurs from southern Mexico to northern Argentina, was not clearly eliminated. Middle American populations are migratory, withdrawing to South America in the winter, and the immatures of both species are very similar (see Ridgely and Gwynne 1989). Nevertheless, other members responded that no extralimital records of Plumbeous Kite are known and that the paler head and notched tail noted on the Point Loma bird probably eliminate that species.

ZONE-TAILED HAWK *Buteo albonotatus* (18). One was on the Plano Trabuco near O'Neill Park, ORA, 22 Dec 1985–17 Jan 1986 (MJL, GMcC, GT, REW; 17-1986).

GYRFALCON *Falco rusticolus* (3). One was at Tule Lake NWR, MOD, 31 Oct 1983 (BEDe; 128-1985). This is only the third record for California, the first being from nearby Lower Klamath NWR also in late October (Roberson 1986). The description suggests that this was an immature bird; immatures typically have a more noticeable vertical streak below the eye and dark gray feet.

YELLOW RAIL *Coturnicops noveboracensis* (54**). One was at Mono Lake County Park, MNO, 15 Jul 1985 (DAG; 158-1985). The date is noteworthy because a Yellow Rail nest was found by W. L. Dawson (1922) on 6 Jun 1922 just south of here in the Long Valley near Lake Crowley, and the species formerly nested to the north at Bridgeport until 1950. The boggy grass at the northwest corner of Mono Lake is suitable breeding habitat if kept free of disturbance.

AMERICAN OYSTERCATCHER *Haematopus palliatus* (7). A bird missing one foot was at Avila Beach, SLO, 25 Oct 1964–late Mar 1965 (GMcC; 115-1986). One was at Santa Barbara Island, SBA, 30 May 1986 (BWA†, RAC; 375-1986).

The bird at Avila Beach represents the second definite mainland record and the first definite record in over 100 years for California. It is also the farthest north that the species is reliably documented in the state: unaccepted sight records exist for MTY and MRN counties. Marantz (1986) mentioned two reports from nearby localities around the time of the Avila bird: Pismo Beach, 11 Jun 1963 (C. Mills, Jr.), and Montaña de Oro State Park, 20 Jul 1966 (Vera Barnes). These may pertain to the same bird at Avila Beach, but the reports are unreviewed and not certain. The Committee would welcome any information on these sightings.

SPOTTED REDSHANK *Tringa erythropus* (3). One juvenile just beginning molt into first basic plumage was in the Santa Maria River valley near Betteravia, SBA, 25 Oct 1985 (LRBe; JLD†, PEL†; 167-1985).

This sighting is dedicated to the memory of Carolyn Fredericksen who died tragically in an automobile accident while searching for this bird. This is the third record for California and the first of a bird in juvenal plumage.

RUFOUS-NECKED STINT *Calidris ruficollis* (4). One alternate-plumaged bird was at Crescent City, DN, 18 Jun 1974 (PFS†; RLeV†; 57-1986). This is the second record for California.

BUFF-BREASTED SANDPIPER *Tryngites subruficollis* (36). All of the following records involved birds in juvenal plumage. Two were at Goleta, SBA, 10–26 Sep 1964 (GMcC; 111-1986). One was at Oceanside, SD, 16 Sep 1967 (GMcC; 117-1986). The following records represent the remaining reports of Buff-breasted Sandpipers for the fall of 1985 (others were reported by Dunn 1988): one at the Salinas sewage ponds, MTY, 23–28 Aug (CT; 183-1986); one at the Smith River mouth, DN, 24 Aug (Figure 3; ADB; 195-1985); singles at Southeast Farallon Island, SF, 30 Aug–4 Sep (PP†; 177-1985) and 6 Sep (PP; 178-1985); one at Crescent City, DN, 6 Sep (ADB; RAE; 162-1985); one at the Lancaster sewage ponds, Antelope Valley, LA, 7–11 Sep (NBB†; JLD†, MH†; 148-1985); two near Imperial Beach, SD, 11 Sep (GMcC, REW†; 64-1986).

The total of 15 birds in the fall of 1985 is surpassed only by the fall of 1978, when as many as 24 were reported from California.

*RUFF *Philomachus pugnax* (32). One in juvenal plumage was at Arcata bottoms, HUM, 21 Sep–8 Oct 1979 (SWH, BBe†; 79-1979).

Originally submitted in 1979, this record was published as not accepted by Binford (1985). This decision was reached after four circulations and following much discussion of the single description then supporting the record. Later, two photographs of a Ruff in juvenal plumage were sent to the Committee, and the record was accepted without question. The Committee is always pleased to correct past decisions; we also welcome any comments that suggest a previous decision might be incorrect.

The Ruff was removed from the Committee's review list in 1981; the species is a regular but rare migrant, primarily in fall, and a rare winter visitor in California.

LITTLE GULL *Larus minutus* (28). One adult was at King Harbor, Redondo Beach, LA, 22–26 Dec 1969 (KLG, GMcC, GSS; 356-1986). Representing the second state record, it was reportedly found on the first date about 3 miles south of this locality on the Palos Verdes Peninsula. Another adult at Inverness, MRN, 21–22 Nov 1984 (RS; 287-1986) is previously unpublished.

The Stockton sewage ponds, SJ, had up to four adults as follows: one from 9 Oct 1985 until a second joined it 11 Jan 1986, a total of three on 18 Mar, four together 14–16 Apr, and two remaining until 28 Apr 1986. A single adult seen foraging over a flooded field near Woodbridge, approximately 16 miles north of the sewage ponds, on 13 Mar 1986, was considered probably the same as one of the three at the Stockton sewage ponds five days later (DGY; JML, MJL, GMcC, JM; record 165-1985 refers to the two wintering birds, and record 478-1986 refers to all other observations by DGY from the earliest to the latest dates). The Committee judged the two wintering birds probably the same as previous adults at Stockton over the past seven winters (21-1979, Luther et al. 1983; 85-1983, 93-1983, 1-1984, 42-1984, Roberson 1986; 269-1984, Dunn 1988).

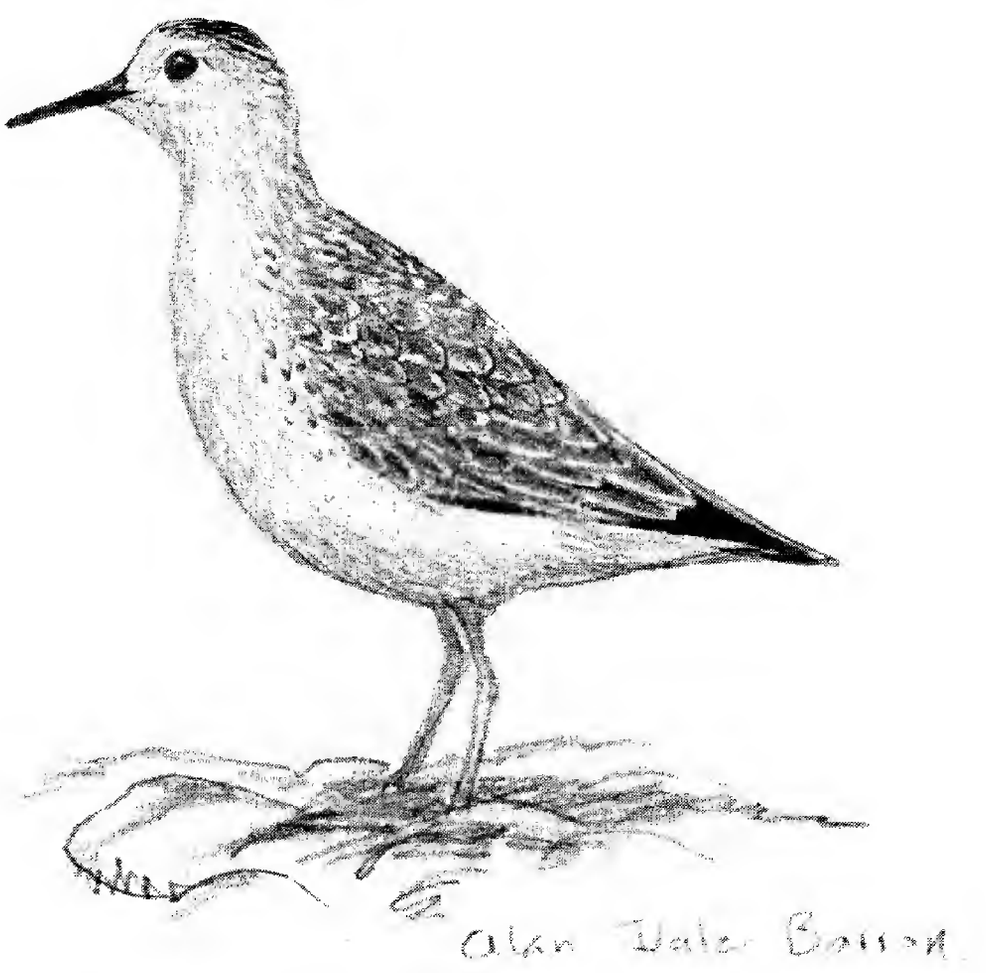

Figure 3. Buff-breasted Sandpiper, mouth of Smith River, Del Norte Co., 24 August 1985.

Sketch by Alan D. Barron

COMMON BLACK-HEADED GULL *Larus ridibundus* (12). One adult was at the Richmond inner harbor, CC, 23–24 Jan 1954 (HLC; 219-1986). An adult at the Stockton sewage ponds, SJ, 10 Nov 1985–Mar 1986 (DGY; SFB†, JML, MJL, GMcC, JM; 5-1986) returned for its eighth winter (see Roberson 1986 for dates of previous occurrences; 20-1979, 2-1984, 84-1983, 43-1985).

The Richmond bird was the first for the state. Since the late 1970s, this species has occurred almost annually in California.

SANDWICH TERN *Sterna sandvicensis* (1). One was seen in a nesting colony of Elegant Terns (*S. elegans*) at San Diego Bay, SD, 12–14 Jun 1985 (REW†; GMcC; 9-1986). This was judged probably the same bird seen here in May 1981 and May–Jun 1982, the only other occurrences of this species in California (Schaffner 1981; 80-1980, Luther et al. 1983; 58-1982, Morlan 1985).

RUDDY GROUND-DOVE *Columbina talpacoti* (2). A male was at Iron Mountain Pump Station, SBE, 11 Oct–3 Nov 1984 (RMcK†; GMcC; 23-1985), and a female was there one year later on 9 Oct 1985 (BW†; MMcC; 62-1986).

These are the first and second accepted records for California, and part of a growing number of reports from the desert Southwest over the past five years. Another report from September of 1984 (record in circulation) would supersede the first of these records and bring the total number of Ruddy Ground-Doves reported in California to 20 through the fall of 1989. Crucial to understanding this increase in sightings are reports north of this species' known range in western Mexico—two reports for the fall of 1982 in southern Sonora and twenty or more birds in northern Sinaloa in the fall of 1984 (Witzeman 1985 and AmB 39:87). Previously, this species had not been known north of southern Sinaloa despite the attention that these areas have received, including a distributional survey of Sonora by van Rossem (1945) and recent Christmas bird counts at Alamos, Sonora. These reports tie in with those from southeastern California, southern Arizona, southern New Mexico, Big Bend, and the lower Rio Grande Valley in Texas, and show a seasonal pattern of primarily fall and winter occurrences. In addition, it appears that the west Mexican race, *C. t. eluta*, is involved in most of these sightings. The male of *eluta* is paler and less richly colored than the east Mexican (and Central American) race, *rufipennis* (Ridgway 1916). Several of the males photographed in the Southwest, including the male at Iron Mountain Pump Station, showed the characters of *eluta*, whereas only one, from Big Bend, showed the characters of *rufipennis*.

The Committee does caution that Ruddy Ground-Doves are held in captivity, though not in great numbers (J. Jennings, president of the American Federation of Aviculture, in litt.), and the possibility exists that birds could be escaping and some even mixing with natural vagrants. Since these reports are restricted to the desert Southwest and fit a seasonal pattern, natural occurrence is strongly suggested. Other species of American ground-doves have shown such long-range dispersal, sometimes coupled with a range expansion. As noted by McCaskie (AmB 43:169), the Inca Dove (*C. inca*) underwent such an expansion beginning in the late 1800s in Arizona and Texas, as documented by Phillips et al. (1964), Oberholser (1974), and Rea (1983). In Texas at least, this expansion was preceded principally by fall and winter occurrences. Indeed, the Inca Dove established itself along the Colorado River in California only recently, between 1948 and 1970 (Monson and Phillips 1981). The Common Ground-Dove (*C. passerina*) has also expanded its range in California since at least 1944, when it was essentially restricted to the extreme southeastern portion of the state, and has now established itself north to southern Santa Barbara County (Spencer 1987).

Once again, however, observers are warned that not all sightings may involve wild birds, and further study is required. The Committee previously rejected a record from Fillmore, VEN, 24–26 Nov 1978 (31-1981, Binford 1985) on the basis of ques-

tionable natural occurrence; this bird was reported prior to the range expansion of the last few years. The first of the current records was accepted by all but two members—the first record to pass under a recent bylaws change allowing acceptance of records with up to two votes questioning natural occurrence on the fourth round. The second record was accepted by all but one member.

A lesson learned by the Committee in attempting to analyze these records was that our knowledge about the status of birds in captivity is extremely limited. Efforts to compile information on the status of this species in captivity failed to obtain good estimates of the numbers held. Declared imports from 1968 to 1972 listed only one Ruddy Ground-Dove (Banks 1970; Banks and Clapp 1972; Clapp and Banks 1973a, 1973b, 1974), and yet a series of books on pet doves (Delacour 1959, 1980; Gos 1989) claimed that the species is frequently imported from Mexico and South America to the United States. However, this statement is repeated unchanged by the same publisher for both authors and probably does not reflect the current situation. The Committee has no way to substantiate this statement, but some members suspect illegal importation occurs.

Regardless of the circumstances, this species presents a new identification problem for California birders, who should now carefully study all ground-doves they encounter, especially in the northern deserts where the Common Ground-Dove is a scarce vagrant. The male Ruddy Ground-Dove is quite richly colored, but the female could be confused with a Common Ground-Dove. The key points to look for on the Ruddy Ground-Dove are the entirely dark bill, complete lack of scaling on head, neck and breast, linear black marks on the scapulars, and black wing linings. These features are diagnostic and were discussed along with other aspects of the identification by Dunn and Garrett (1990).

BLACK-BILLED CUCKOO *Coccyzus erythropthalmus* (7). One immature was on Southeast Farallon Island, SF, 18 Oct 1985 (PP†; 12-1986). This record is over two weeks later than the next latest record for the state, and that record involved a bird dead one to two weeks (Morlan 1985).

SNOWY OWL *Nyctea scandiaca* (38**). Two specimens were taken at Eureka, HUM, 8 Dec 1896 (CM-EHS 644 and 678; 318-1986). A minimum of four were in the coastal dunes near the Mad River estuary, HUM, 31 Jan–26 Mar 1967 (GMcC; 143-1986); these were the first Snowy Owls seen in California since the winter of 1916–17 (Harris and Yocum 1968). One was reportedly photographed, but the photograph is not with the record. One was at Berkeley, ALA, 16 Feb 1974 (SFB; 221-1986); this occurrence was part of the record invasion of Snowy Owls into California during 1973–74 (AmB 28:685).

The Eureka specimens are the only evidence known to the Committee for reports of this species from Humboldt County "in flocks" during the winter of 1896–97, when these and several other birds were reported in California (Grinnell and Miller 1944). The Committee does not count pre-1900 reports in the total number of records.

*BARRED OWL *Strix varia* (4). One at Howland Hill near Crescent City, DN, 3–12 May and 22 Dec 1985 (SFB, GSL; 224-1986) was judged the same bird first found here 12 Mar 1982 and detected intermittently until recently (26-1982, Binford 1985; 28-1983, Morlan 1985). This species is now resident in this region of California and has been removed from the Review List.

BROAD-BILLED HUMMINGBIRD *Cynanthus latirostris* (27). One immature male was at Goleta, SBA, 16–25 Oct 1985 (JLD†, PEL, REW†; 168-1985). Another male was at San Marcos Pass, near Santa Barbara, SBA, 3–5 Nov 1985 (J&GH; LRBe†; 169-1985). An adult male at Balboa Park, San Diego, SD, 1 Dec 1985–5 Jan 1986 (GMcC, REW; 23-1986) was considered the same bird first found

there in the winter of 1979–80 (43-1980, Binford 1983; 240-1980, 241-1980, 2-1983, Binford 1985—the last record was inadvertently published without a record number but the bird was reported as present 18 Dec 1982–5 Jan 1983). An immature male was at Coronado, SD, 11 Jan–*28 Feb 1986* (JML, MJL, GMcC, DR, REW; 26-1986). Another immature male was at Goleta, SBA, 27 Jan–22 Feb 1986 (LRBe†, JLD†, PEL; 74-1986).

RUBY-THROATED HUMMINGBIRD *Archilochus colubris* (2). An immature male was captured, examined, and released on Southeast Farallon Island, SF, 21–22 Aug 1985 (Figures 4 and 5; PP†; TP†; 179-1985). This represents the second record for California.

Southeast Farallon Island biologists are to be commended for recognizing this bird as unusual and taking careful notes and measurements. At the time, characters used to distinguish this species from the Black-chinned Hummingbird (*A. alexandri*) were culmen length, bright green upperparts, and a bright buffy wash with admixture of green in the flanks. While useful, these characters are not proven to separate the two species in all cases. Therefore, the descriptions and photographs were sent to Louisiana State University for review by J. V. Remsen, Jr. and Nancy L. Newfield, both of whom supported the identification and directed the Committee's attention to features of the primaries that were diagnostic for Ruby-throated but that were not initially studied or described when the bird was in hand. The tenth (outer) primary tapered evenly to a narrow, blunt tip, which is quite different from the comparatively broad and strongly curved outer primary of the Black-chinned Hummingbird. This feature, clearly visible in two photographs, the short culmen, the strongly sculptured notches on the inner primaries, and the plumage features mentioned above, combine to eliminate the Black-chinned. The heavily spotted throat and the distinct notches on the inner primaries identify the bird as an immature male. Phillips (1975) first discussed using the outer primaries to distinguish the Ruby-throated and Black-chinned Hummingbirds. Baltosser (1987) quantified these characters in his comprehensive key to *Archilochus* and *Calypte* (in North America).

RED-HEADED WOODPECKER *Melanerpes erythrocephalus* (2). One at Point Saint George, DN, 9 Jun 1986 (JKg†; ADB, GSL, WER; 290-1986) established the second accepted record for California. This bird exhibited two black bars in the secondaries, indicating that it was one year old; the juvenal plumage of Red-headed Woodpecker has barring in the secondaries and tertials, some of which may be retained following its molt into first alternate plumage (Bent 1939).

THREE-TOED WOODPECKER *Picoides tridactylus* (1). One male at South Fork Pine Creek, Warner Mountains, MOD, 2 Nov 1985 (JT; 146-1985) represents the first record for California. A potential first state record is treated with great scrutiny by the Committee, especially when it is only a sight record by one observer. In this case, the record was accepted, following two circulations, by all but one member. The extremely detailed description was convincing and overcame concerns that this species is largely resident within its range, only occasionally showing irruptive fall movements. The pattern and amount of white noted on the back suggest that the bird was of the race *fasciatus*, which occurs in nearby southern Oregon. The nearest report to this sighting is approximately 130 miles to the northwest and involves a family group of three birds at Fourmile Lake along the east base of Mount McLoughlin, Oregon (Gabrielson and Jewett 1940). Over most of its range in western North America, the Three-toed Woodpecker inhabits forests of Engelmann Spruce (*Picea engelmannii*) and Mountain Hemlock (*Tsuga mertensiana*), or forests of Lodgepole Pine (*Pinus contorta*); of these, only Lodgepole Pine grows in the Warner Mountains, and then only in small stands, confirming the likelihood that this record represents only a vagrant. Details of this record along with distributional and identification summaries were published by Trochet et al. (1988).

GREATER PEWEE *Contopus pertinax* (19). One was at Griffith Park, Los Angeles, LA, 31 Dec 1967–*10* Apr 1968 (GMcC; 124-1986). One was near Balboa Park, San Diego, SD, 21 Dec 1985–26 Jan 1986 (REW†; JML, MJL, GMcC, JEP, DR; 25-1986).

YELLOW-BELLIED FLYCATCHER *Empidonax flaviventris* (2). An immature female present on Southeast Farallon Island, SF, 27–28 Sep 1983 (KHa; 87-1986) was found in weakened condition on the second day and later died. A detailed analysis of the specimen (CAS 71430), the first for California, was published by DeSante et al. (1985). This is the second record for the island and the state.

DUSKY-CAPPED FLYCATCHER *Myiarchus tuberculifer* (11). One was at Goleta, SBA, 1 Dec 1985 (JLD, PEL; 75-1986).

GREAT CRESTED FLYCATCHER *Myiarchus crinitus* (17). One was at Point Fermin, San Pedro, LA, 26 Sep 1970 (GSS, SW; 357-1986). One was at Montaña de Oro, SLO, 26–29 Sep 1984 (GPS; CM; 1-1985). One was at the Big Sur River mouth, MTY, 30 Sep 1984 (RFT; 227-1984). One was at Southeast Farallon Island, SF, 5 Sep 1985 (PP†; 186-1985). One was at Doheny State Beach, ORA, 30 Sep 1985 (DRW†; 84-1986).

The Farallon bird represents the earliest fall record for the state by two weeks, and the Point Fermin bird record is the second for California.

THICK-BILLED KINGBIRD *Tyrannus crassirostris* (7). One was at Point Loma, SD, 18–23 Oct 1967 (GMcC; 122-1986). The same adult returned to Peters Canyon, Lemon Heights, ORA, 26 Nov 1983–3 Jan 1984 (KAH; 97-1986) and 26 Oct 1985–9 Mar 1986 (JML, MJL, GMcC, REW; 16-1986); apparently, this bird was missed by observers during the intervening winter. This is considered the same bird as first found wintering here 19 Dec 1982–9 Apr 1983 (previously accepted 110-1982, Morlan 1985).

SCISSOR-TAILED FLYCATCHER *Tyrannus forficatus* (38). One male was collected by Roland H. Wauer at Furnace Creek, Death Valley NM, INY, 3 May 1962 (DVNMM 10896; 252-1986). Single birds were seen near Imperial Beach, SD, as follows: 22 Feb–early Apr 1965 (GMcC; 114-1986), 21–23 Sep 1967 (GMcC; 118-1986), 16 Oct 1968 (GMcC; 126-1986), and 3–6 Nov 1971 (GMcC; 140-1986). One was at Furnace Creek Ranch, Death Valley NM, INY, 18 May–1 Jun 1975 (GMcC; 142-1986). One was at Oasis, MNO, 31 May 1977 (JVR; 258-1986). A single female constructed and sat on a nest near Needles, SBE, 26 May–end of Jun 1979 (GMcC; 145-1986). Four years later at the same locality, what was probably the same bird was again seen sitting on a nest, 19 Apr to at least 14 May 1983 (SFB†, EAC†; 227-1986). One was at the Prado Basin near Corona, RIV, 6 Jan–3 Feb 1980 (JLD, PEL; 239-1986); a photograph of this bird was published (AmB 34:307). One was at Triangle Park, Big Pine, INY, 31 Jul 1985 (MCS; 99-1985). One was near Lompoc, SBA, 6 Sep–13 Oct 1985 (LRBe, JLD†, PEL†; 170-1985). One was on Southeast Farallon Island, SF, 30 Sep 1985 (MM; 185-1985). One was at the Smith River estuary, DN, 5–6 May 1986 (RAE; GSL; 285-1986). One was at San Diego, SD, *13*–17 Jun 1986 (MF†, JF; 371-1986). One was near Imperial Beach, SD, 17 Aug–19 Oct 1986 (GMcC; BBr; 377-1986).

The first nest built and attended by the female at Needles was reported to contain five eggs (AmB 33:806), but these were apparently abandoned (AmB 33:897–898). In both nesting attempts, the bird was presumed mated to a Western Kingbird (*T. verticalis*). These are the only occurrences of nesting by Scissor-tailed Flycatcher in California.

SEDGE WREN *Cistothorus platensis* (2). One was found singing at Little Shasta Valley, SIS, 8 Jun–4 Jul 1986 (Figures 6–8; REk†; HCl†, SEF, KLH, JML [voice

recording], MJL, GMcC, JM, DR, DGY; 263-1986). This is only the second record for California.

VEERY *Catharus fuscescens* (6). One adult was captured and banded on Southeast Farallon Island, SF, 26–29 Sep 1985 (PP†; 184-1985). One was at Deep Springs, INY, 17 May 1986 (TME; BSc, JML, MJL, CM; 264-1986).

The observer of the Farallon bird suggested that it was from western populations of the Veery, *C. f. salicicola* (AmB 40:331), an opinion based on experience with the nominate race of eastern North America. Most Committee members, however, cautioned against making any subspecific identification. The distinction between the races is based on differences in color tone to the upperparts and, especially, patterning on the underparts, but these differences are best determined when individuals of both subspecies can be compared side by side.

GRAY-CHEEKED THRUSH *Catharus minimus* (4). One was trapped and banded on Southeast Farallon Island, SF, 10 Oct 1979 (RPH†; 10-1981).

RUFOUS-BACKED ROBIN *Turdus rufopalliatus* (5). One was at Saratoga Springs, Death Valley NM, SBE, 19 Nov 1974 (MA; 235-1986). This is the second record for California.

GRAY CATBIRD *Dumetella carolinensis* (24). One landed on a boat 15 miles off Oceanside, SD, 26 Oct 1983 (MWG†; 100-1987). One female (with brood patch) was banded on Southeast Farallon Island, SF, 24 Jun 1985 (JP†; 180-1986).

YELLOW WAGTAIL *Motacilla flava* (6). One immature was at Abbotts Lagoon, Point Reyes NS, MRN, 12–13 Sep 1985 (ALE†; RAE; 159-1985). This record falls in the middle of the narrow 12-day span of dates over which this species has occurred in California, 7–19 Sep.

BLACK-BACKED WAGTAIL *Motacilla lugens* (3). One was seen in flight at close range near the Mad River estuary, HUM, 13 May 1985 (RLeV; 247-1986).

One member voted to accept this as only identifiable to White (*M. alba*)/Black-backed wagtail, feeling that the observation was too brief for careful checking of the wing pattern. Other members, while expressing some reservations, endorsed the record as this species because the flight feathers were described as being mostly white, which, along with other characters distinguishes, this species from the White Wagtail.

RED-THROATED PIPIT *Anthus cervinus* (32). One was near Imperial Beach, SD, 6–11 Oct 1985 (GMcC; 65-1986). More Red-throated Pipits have been seen in this area than anywhere else in California.

YELLOW-THROATED VIREO *Vireo flavifrons* (22). One male was collected by Bruce P. Paige at Wildrose Campground, Death Valley NM, INY, 7 May 1963 (DVNMM 10904; 251-1986) and published by McCaskie (1968) as the first record for California. One was seen and heard singing at Fort Piute, SBE, 30 May 1979 (GMcC; 144-1986). One was at Los Osos, SLO, 14–19 Apr 1985 (JTH, KAH; 103-1985). One was at Huntington Beach, ORA, 26–28 Sep 1985 (JRG†; 68-1986). One was at Santa Barbara, SBA, 1 Oct 1985 (HR; 171-1985). One was at Point Loma, SD, 13–20 Nov 1985 (CM, GMcC, REW†; 2-1986).

PHILADELPHIA VIREO *Vireo philadelphicus* (51). One was near Imperial Beach, SD, 4–*11* Oct 1970 (GMcC; 135-1986). One was at Pismo State Beach, Oceano, SLO, *17* Sep 1985 (JAJ; 78-1986). One was at Bodega Bay, SON, 23 Sep 1985 (BDP; 119-1985).

YELLOW-GREEN VIREO *Vireo flavoviridis* (13). One was at Dana Point, ORA, 22–27 Sep 1964 (GMcC; 110-1986). One was near Imperial Beach, SD, 23 Sep

1967 (GMcC; 119-1986). One was on Southeast Farallon Island, SF, 19 Oct 1982 (RPH†; 107-1987). One was at Point Loma, SD, 16–18 Sep 1983 (BEDa; 296-1986). One was on the Oxnard plain, VEN, 3–4 Oct 1983 (JLD, PEL; 76-1986). One was at Stinson Beach, MRN, 27–30 Oct 1985 (JM; 172-1986).

The Dana Point bird represents the second record for California (McCaskie 1968), but an earlier report of one collected near Riverside, 1 Oct 1887 (Price 1888) has not yet been reviewed by the Committee, as the specimen has not been located.

BLUE-WINGED WARBLER *Vermivora pinus* (5). One was seen near Imperial Beach, SD, 26 Sep 1964 (GMcC; 112-1986) for the second accepted record in California (one earlier report has not been reviewed yet); Roberson (1980) published the incorrect date of 25 Sep. One was at California City, KER, 25 May 1986 (JWi; 231-1986); this record is not previously published.

YELLOW-THROATED WARBLER *Dendroica dominica* (43). One male was at Corn Springs, RIV, 25 Apr 1981 (AS†; 259-1986). One was seen and heard singing at Berkeley, ALA, 14 May 1985 (JCT; 48-1985); this is previously unpublished. One singing bird was at Point Reyes NS, MRN, 12 Jun 1985 (MCM; 147-1985); this also is previously unpublished. One was at Point Loma, SD, 12 Oct 1985 (REW; 10-1986).

The Corn Springs bird, a color photo of which appears in Clarke (1989), showed characters of the race *albilora*, while the other records were suggestive of that race or undetermined. This subspecies, typically white-lored and white-chinned, is the race most frequently found in California.

GRACE'S WARBLER *Dendroica graciae* (16). One adult was at Ventura, VEN, 23 Oct 1985–1 Feb 1986 (JLD, GMcC, REW; 22-1986) and regarded as spending its second winter here (previously accepted 6-1985, Dunn 1988). A male returning for its seventh winter was at Montecito, SBA, *19 Oct* 1985–21 Feb 1986 (PEL, JLD; 77-1986); this is the same bird as previously accepted (114-1984, Roberson 1986; 3-1985, 221-1984, Dunn 1988). Another bird, possibly a female, only a few blocks away in Montecito, SBA, 10 Nov 1985–21 Feb 1986 (PEL, GMcC, REW; 20-1986) was spending its second winter there (previous record 5-1985, Dunn 1988). One singing male was at Clark Mountain, SBE, 23–*28* May 1986 (PDG, HAG; DCR, JWh, PR, SEF; 327-1986). This record was reported as involving at least two males (AmB 40:525), but observations on the later date showed that one male was covering a large territory.

PINE WARBLER *Dendroica pinus* (14). An immature male collected at Imperial Beach, SD, 22 Oct 1966 (GMcC; SDNHM 36049; 15-1985) is the first record for California. A singing male was photographed and its voice was recorded (recording to CAS) at the Clear Creek Outdoor Education Center in the Angeles NF, 10 miles north of La Cañada, LA, 7 Apr 1984 (HP†; 249-1984); this record is previously unpublished and is the first for LA. One was at Coronado, SD, 15 Dec 1984–9 Mar 1985 (JLD, JML, MJL, GMcC, REW†; 11-1985); this was published as a female, but the descriptions indicate that it was probably an immature male. One was at Long Beach, LA, 1 Jan–8 Mar 1986 (JLD, KLG, JML, MJL, CM, GMcC, REW†; 24-1986).

CERULEAN WARBLER *Dendroica cerulea* (9). An immature male was at Cambria, SLO, 13–15 Oct 1985 (GPS, JTH, KAH; JLD, TME, CM; 161-1985).

This bird was initially identified as an aberrant Black-throated Gray Warbler (*D. nigrescens*). The cautious observer should keep in mind the possibility of mistaking a Black-throated Gray, especially immatures, for Cerulean. Confusion with dull Blackburnian Warbler (*D. fuscescens*) in autumn has been a problem as well (see Lehman 1987).

*PROTHONOTARY WARBLER *Protonotaria citrea* (51). One male was at Point Loma, SD, 27 Sep 1969 (GMcC; 130-1986). One was at Doheny State Beach, ORA, 8–11 Oct 1981 (BSc; 256-1986). A male was at Furnace Creek Ranch, Death Valley NM, INY, 26 May 1984 (JLA; 236-1986). One was at Furnace Creek Ranch, Death Valley NM, INY, 20 Oct 1984 (GMcC; 232-1986). One was at Carpinteria, SBA, 2–18 Sep 1985 (LRBa; JML; 150-1985), and another was there 15–21 Sep 1985 (LRBa; 149-1985). One male was at Cambria, SLO, 13–19 Oct 1985 (TME; JLD, CM, GPS; 3-1986). One was at Inglewood, LA, 18 Oct 1985 (LMcC, NMcC; 79-1986). One male at Pismo State Beach, Oceano, SLO, 27 Oct 1985 (J&AC; 255-1987) is previously unpublished. One was at Smith River, DN, 17–24 Nov 1985 (GSL, ADB; RAE, LPL; 164-1985).

WORM-EATING WARBLER *Helmitheros vermivorus* (32). A female collected on Southeast Farallon Island, SF, 5 Jul 1965 (SFSU, now CAS 84320; 272-1986) is the second record for California (Tenaza 1967). One was on the Otay Mesa, SD, 12 Sep 1971 (GMcC; 138-1986). One was at Point Loma, SD, 16 Sep 1984 (BF; REW; 238-1984). One was at Goleta, SBA, 21–22 Aug 1985 (TEW; 172-1985).

KENTUCKY WARBLER *Oporornis formosus* (23). One was at Lincoln Park in San Francisco, SF, 16 May 1981 (ASH; 255-1986). One was at Montaña de Oro State Park, SLO, 27 Oct 1983 (GPS; 40-1984). One was clearly heard singing but only briefly glimpsed at the Yurok Experimental Forest, Klamath, DN, 19–20 May 1985 (RAE; 96-1985). One was at Iron Mountain Pumping Station, SBE, 22 May 1985 (BH; 108-1985). One male was at Carpinteria, SBA, 22–23 Aug 1985 (LRBe; 82-1986), a rather early fall date. One was at Oasis, MNO, 15 Sep 1985 (AME; 80-1986). A male was at the old Eureka airport willows near Fairhaven, HUM, 11 Jun 1986 (GSL; 289-1986).

CONNECTICUT WARBLER *Oporornis agilis* (29). One immature collected near Imperial Beach, SD, 27 Sep 1963 (GMcC; SDNHM 30776; 16-1985) represents the second state record (McCaskie 1970). The following single birds were caught and banded on Southeast Farallon Island, SF: 23–29 Sep 1974 (DDeS†; 81-1978); 23 Sep 1974 (DDeS†; 174-1986), when another was seen only (DDeS; 175-1986); 10 Oct 1982 (RPH†; 114-1987); 25 Sep 1983 (GSM; KHa†; 208-1987); 20 Sep 1984 (RPH; PP†; 115-1987); 6–7 Sep 1985 (PP; 183-1985), reportedly photographed but the photograph is not in Committee files; 6 Sep 1985 (PP†; 194-1985); and 1–2 Oct 1985 (PP†; 14-1986). One was at Pismo State Beach, Oceano, SLO, 13–14 Oct 1985 (BSc; CM; 4-1986).

The two records from the first week of September are exceptionally early, being the earliest fall records for California. Nearly all records of the Connecticut Warbler are after mid-Sep and average slightly later than those of the Mourning Warbler in fall.

MOURNING WARBLER *Oporornis philadelphia* (32). One immature female collected on Point Loma, SD, 3 Oct 1968 (GMcC; SDNHM 36933; 13-1985) constitutes the first record for California (McCaskie 1970); an earlier report, of a bird collected in June of the same year from Deep Springs, INY, has not been accepted by the Committee (decision will be published in a forthcoming report). One at Bolinas, MRN, 16 Sep 1973 (DDeS; 179-1986) was not included in AmB. The following birds were on Southeast Farallon Island, SF: one, seen only, 17–18 Sep 1974 (DDeS; 178-1986); three caught, banded, and each photographed 25 Sep 1974 (DDeS†; 82-1978, 37-1984, 176-1986); and one banded 26 Sep 1974 (DDeS; 177-1986). One was also on Southeast Farallon Island 20 Sep 1984 (PP†; RPH†; 119-1987). A male was at Mesquite Springs, Death Valley NM, INY, 25 May 1985 (JWh; 107-1985). One was banded on Southeast Farallon Island, SF, 4 Sep 1985 (PP†; 182-1985). One was near Imperial Beach, SD, 21 Sep 1985 (GMcC; 66-1986). One was at Goleta, SBA, 26 Sep 1985 (PEL; JLD, LRBe; 173-1985).

Figure 4. Ruby-throated Hummingbird, Southeast Farallon Island, San Francisco Co., 21 August 1985.

Photo by Teya Penniman

Figure 5. Ruby-throated Hummingbird, Southeast Farallon Island, San Francisco Co., 21 August 1985 (note the shape of the primaries).

Photo by Teya Penniman

Figure 6. Sedge Wren, Little Shasta Valley, Siskiyou Co., 23 June 1986.

Photo by Ray Ekstrom

Figure 7. Sedge Wren, Little Shasta Valley, Siskiyou Co., 28 June 1986.

Photo by Herbert Clarke

SCARLET TANAGER *Piranga olivacea* (40). A male was at Point Loma, SD, 14–21 Oct 1967 (GMcC: 120-1986). One female was near Imperial Beach, SD, 4 Nov 1967 (GMcC: 123-1986). An immature male was banded on Point Loma, SD, 29 Oct 1968 (GMcC: 127-1986). A female was on Point Loma, SD, 7–17 Nov 1969 (GMcC; 131-1986). One female was at Scotty's Castle, Death Valley NM, INY, 23–29 May 1970 (GMcC; 132-1986). A female was at Point Loma, SD, 12 Oct 1984 (REW, GMcC; 223-1984). An adult male was at Santa Barbara, SBA, 6–7 Oct 1985 (PWC; CM: 174-1985). An immature male was at Ventura, VEN, 27 Oct 1985 (JSR; CM; 175-1985). One immature male was at Point Loma, SD, 13–16 Nov 1985 (REW; GMcC; 11-1986).

*NORTHERN CARDINAL *Cardinalis cardinalis* (3). An immature male was at Earp (Wheel-er-In trailer park), SBE, 4 Aug 1968 (GMcC; 216-1986), and a pair was seen there 30 Apr 1977 (GMcC; 215-1986). Up to four were reported over a three-year period along the Colorado River about 10 miles south of Earp at the Vidal Wash, SBE/RIV, 23 Mar 1983–*28 Feb 1986* (JLD, EGr, BWK, JML, MJL, CM; 74-1985). A small population is known to have existed in this area since 1946, when A. J. van Rossem and Loye Miller, working on a report from Boris Krichesky, observed three males, a female, and a nest five miles north of Earp on 7 May of that year (van Rossem 1946; specimen of male 33414 in the Dickey Collection at UCLA). These birds were identified as the race *superba*, which occurs in Arizona and part of New Mexico south to the Mexican state of Sonora and which has undergone an expansion of its range since the late nineteenth century, including establishment of a population along the nearby Bill Williams River in Arizona (Phillips et al. 1964, Rea 1983). The population has had a tenuous hold in California, and continued disturbance to the brushy habitats bordering the Colorado River endangers its existence. The race involved in the records reported here has not been determined. The race *superba* has a longer tail and wing than the nominate race of eastern North America; males of *superba* show little or no black crossing the forehead and have the crest as red as the breast, whereas males of the nominate race show black across the forehead and have a crest that is duller red than the breast (Ridgway 1901).

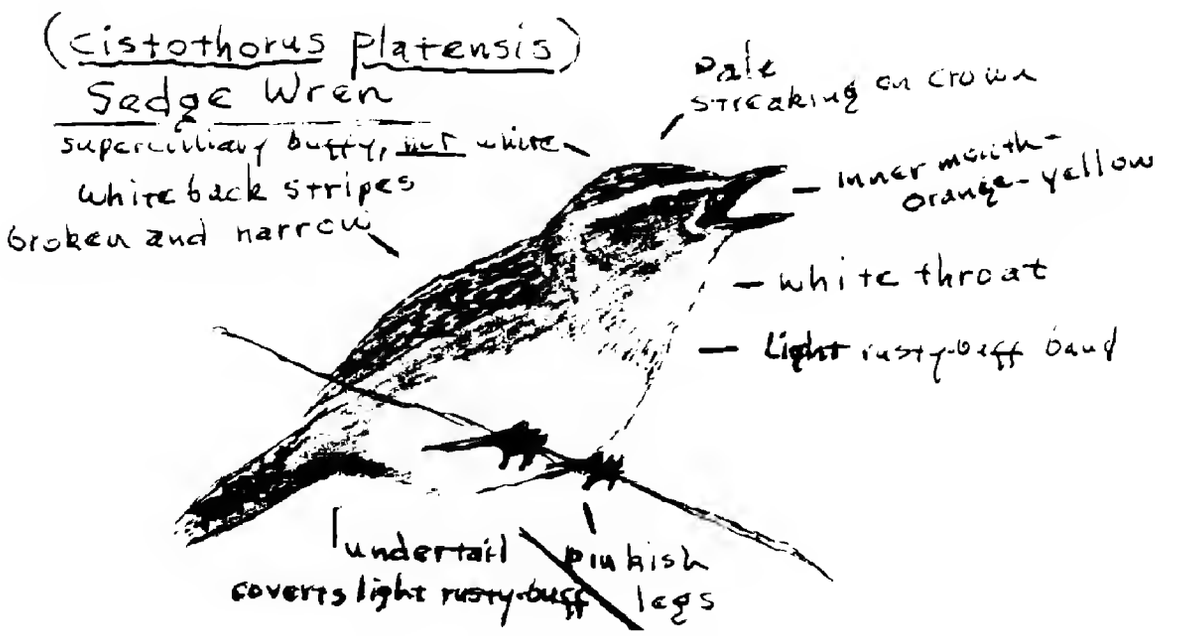

Figure 8. Sedge Wren, Little Shasta Valley, Siskiyou, 8 June 1986.

Sketch by Ray Ekstrom

Prior to van Rossem's observations, the Northern Cardinal was known in California since at least 1880 as an escape or introduction. Alden Miller (1928) summarized these occurrences, including the establishment of the nominate race at El Monte, LA, since 1923; the viability of that population has not been determined by the Committee, however. It should be noted that while these birds are of the eastern race, several individuals of the race *superba* were released at Riverside (1914), Montebello (1925), and Los Angeles (1930) by W. J. Sheffler (Michener and Michener 1938).

The Committee no longer reviews records of this species, and the total number given above represents only records accepted in this report and the eighth report (Morlan 1985). Information on introductions is still requested.

PYRRHULOXIA *Cardinalis sinuatus* (10). One female was east of Lancaster in the Antelope Valley, LA, 7–10 May 1983 (JLD; KLG; 117-1983). One male was at Encinitas, SD, 26–27 May 1983 (GMcC; 89-1986). Another male was at Cottonwood Springs, Joshua Tree NM, RIV, 1 Jun 1986 (GH; 372-1986).

While this species has exhibited a tendency for long-distance dispersal, the Encinitas bird is only the second record accepted for the coastal slope of California; all others have been from desert areas, which are contiguous with similar habitats occupied within the normal range of the species.

PAINTED BUNTING *Passerina ciris* (13). An immature was caught and banded at Lanphere Dunes, HUM, *12* Sep 1984 (JCS, KVR†; 78-1985). Single immatures were found on Southeast Farallon Island, SF, as follows: 14 Sep 1984 (GW, EH; 122-1987) and 27 Sep–6 Oct 1984 (PP; RPH†; 123-1987). One male was near Oasis, MNO, 23 May 1986 (PJM; DR†; 262-1986).

The Lanphere Dunes bird, the northernmost known for California, had a deformed crossed bill causing several members to note the possibility of its having been caged. However, the records of immatures from Southeast Farallon Island later the same season supported a pattern of natural occurrence. The Oasis bird represents the first accepted spring record for California and was possibly a one-year-old male, having pale red underparts. This color, however, was not like that observed in some caged male Painted Buntings, which show yellow to yellow-orange underparts.

CASSIN'S SPARROW *Aimophila cassinii* (15). One was near the mouth of the Little River, HUM, 29 May 1984 (KVR; 462-1986). Single birds were on Southeast Farallon Island, SF, 1–3 Oct 1984 (PP; RPH†; 211-1987), 17–30 Sep 1985 (PP†; 181-1985), and 29 Sep–2 Oct 1985 (Figure 9; PP†; 180-1985). One was at Bolsa Chica, ORA, 10–18 May 1986 (CM, DRW, GMcC; 268-1986).

The first of the Farallon birds in 1985 was quite rufous in comparison to the gray-brown bird that arrived later. This coloration and the large bill initiated thoughts of Bachman's Sparrow (*A. aestivalis*), which is normally found only in the southeastern United States and is unrecorded in California. The correct identification was based on the anchor-shaped black marks on the uppertail coverts, the moderate barred pattern to the tail, lack of an orange tinge to the plumage or heavy streaks in the back shown by Bachman's, and the presence of pale tips to the outer tail feathers. Wolf (1977) analyzed the genus *Aimophila* and discussed some of these characters; Kaufman (1990) discussed the field identification of Cassin's Sparrow.

*SHARP-TAILED SPARROW *Ammodramus caudacutus* (30). One was at Morro Bay, SLO, 12 Nov 1970 (RLeV†; 245-1986). One was near Palo Alto Baylands, SCL, 22 Dec 1980 (EGu; 205-1986); this is considered the same as one of up to three birds wintering there from 1980 to 1983 (record 32-1983, which now includes two on 22 Nov 1980, a maximum of three 9 Jan–6 Feb 1982, and up to two 11 Oct 1982–1 Mar 1983; see Morlan [1985] for how the Committee previously handled this record). One was at Morro Bay, SLO, 19 Nov–4 Dec 1983 (CM; 70-1986). One at Bolinas Lagoon, MRN, 8 Dec 1985 (MJL; B&MS; 160-1985) is not previously published.

Figure 9. Two Cassin's Sparrows, Southeast Farallon Island, San Francisco Co., 29 September 1985.

Photo by Peter Pyle

Figure 10. Snow Bunting, Point Lobos State Reserve, Monterey Co., 27 October 1985.

Photo by Ronald L. Branson

SNOW BUNTING *Plectrophenax nivalis* (21). One was at Sacramento NWR, GLE, 4 Nov 1961 (GMcC; 96-1986). One was at Southeast Farallon Island, SF, 30 Oct 1982 (PP; 125-1987). One at Point Lobos State Reserve, MTY, 22 Oct–1 Nov 1985 (Figure 10; RLB†, DR†; 137-1985) was published by Morlan and Erickson (1988). One was near Lake Talawa, DN, 14 Nov–3 Dec 1985 (ADB, RAE; 163-1985).

The Point Lobos record is the southernmost for the coast of California.

COMMON GRACKLE *Quiscalus quiscula* (13). One at Deep Springs, INY, 10–12 Jun 1986 (BSa; 374-1986) showed the characteristics of the Bronzed Grackle, *Q. q. versicolor*, the only race known to have occurred in California.

BRAMBLING *Fringilla montifringilla* (3). One was at Arcata Marsh, HUM, 20 Nov 1985 (JMH; 293-1986). One was at Chico, BUT, 11–19 Feb 1986 (RK†; 265-1986). Both of these records were published by Morlan and Erickson (1988).

These are the second and third records of this Palearctic finch for the state. The Arcata bird was described as having black flecking in the face, which indicates that it was probably a male, whereas the Chico bird showed a rather plain gray face, which is more typical of females.

COMMON REDPOLL *Carduelis flammea* (3). A flock of up to twenty-four was at Tule Lake NWR, SIS, 29 Dec 1985–11 Jan 1986 (Figure 11; ADB; LRBe†, JLD†, RAE, MJL, CM, GMcC, DR, JT†; 8-1986). A separate flock of thirty was at Lower Klamath NWR, SIS, 20 Jan–2 Mar 1986 (SFB, LCB, JML, JM; 63-1986). These are the second and third accepted records for the state, although one previous record is still in circulation. The first record, in 1899, was also of a flock in this same region of California (Roberson 1986).

Figure 11. Common Redpoll, Tule Lake National Wildlife Refuge, Siskiyou Co., 31 December 1985.

Photo by Louis Bevier

Careful study of the flocks revealed females, immatures, and adult males, which showed streaked rumps and undertail coverts. These characters are important in distinguishing the Common Redpoll from the Hoary Redpoll (*C. hornemanni*), which is unrecorded in California but has occurred south to Oregon. In autumn, both species of redpoll are in fresh plumage and appear paler than in late spring and summer when the plumage is worn. This is due to the wide pale edges of the fresh feathers; thus, late autumn is when Common Redpolls, especially adult males showing rather whitish rumps, are confusingly similar to Hoary Redpolls. By contrast, immature and adult female Hoary Redpolls (especially the circumpolar subspecies *exilipes*) show moderate streaking when these pale edges are worn away and their appearance becomes more similar to Common Redpoll (Molau 1985). The identification of these intermediate birds has been variously interpreted, some considering them examples of hybrids or part of a continuum of one species (Troy 1985), others of two species with complex, overlapping plumages (Knox 1988, Molau 1985). It should be noted that the nominate race of Hoary Redpoll, which breeds only on Ellesmere and Baffin islands and in northern Greenland, is quite distinct, being larger and paler than the circumpolar *exilipes*. Recently, the AOU Committee on Classification and Nomenclature rejected a proposal to merge these taxa (AOU 1989). A cautious approach to the identification is urged. Observers should pay special attention to the bill shape (comparatively short and deep in Hoary), and the pattern of streaks on the rump, undertail coverts, and flanks (faint and narrow streaking or none at all in Hoary, depending on age, sex, and race).

UNACCEPTED RECORDS, identification questionable

YELLOW-BILLED LOON *Gavia adamsii*. One at Bodega Bay, SON, 18 Jan 1971 (92-1985). One at Lake El Estero, Monterey, MTY, 11 Apr 1986 (253-1986). The Bodega Bay report was published by Bolander and Parmeter (1978) with the date 17 Jan 1971. A majority of the members felt that the description did not eliminate Common Loon and that it failed to point out key features such as culmen color and the post-auricular spot characteristic of Yellow-billed Loon. Identification of this species is treated by Binford and Remsen (1974) and Appleby et al. (1986).

*COOK'S PETREL *Pterodroma cookii*. One 10 miles west of Southeast Farallon Island, SF, 30 Jun 1985 (27-1986).

BLUE-FOOTED BOOBY *Sula nebouxii*. One at Moss Landing, MTY, 8 Oct 1984 (45-1987). Most members felt that this bird was a booby but that the Red-footed Booby (*S. sula*) was not eliminated. In fact, some aspects of the description seemed to indicate Red-footed—entirely dark wings and upperparts apparently lacking any white mottling. Since this record circulated following the fall of 1987 when several Red-footed Boobies were seen in California (records in review; see AmB 42:128, 135), the Committee was very cautious about this possibility.

WHOOPER SWAN *Cygnus cygnus*. Two at Pescadero Beach, SM, 20 Nov 1985 (170-1986). These birds were felt by many to be immature Tundra Swans (two were seen at the same locality). In addition, the details were insufficient to make a positive determination.

MISSISSIPPI KITE *Ictinia mississippiensis*. One at Hetch Hetchy Reservoir, Yosemite NP, TUO, 27 Jun 1983 (50-1984). A majority (6–4) of the Committee accepted this report on its final round, but the others noted that the description did not correctly match any known plumage for this species. In addition, the bird was heard giving "a long, clear, dying whistle," a call for this species that was unfamiliar to any member. It may well have been a Mississippi Kite, but the details were not quite convincing. This would have been the first record for the Sierra Nevada.

UNACCEPTED RECORDS, identification questionable (Cont.)

COMMON BLACK-HAWK *Buteogallus anthracinus*. One at Barker's Dam, Joshua Tree NM, SBE, 23 Apr 1985 (110-1985).

This report was published (AmB 39:350). The brief and inconclusive description from only one of the observers and the extraordinary rarity of the species in California was the primary reason for the Committee preferring to leave this bird as unidentified. An individual of this species was seen at Thousand Palms Oasis, RIV, only ten days before this report (previously accepted 46-1985, Roberson 1986; Daniels et al. 1989). That locality is approximately 20 miles to the southwest over the Little San Bernardino Mountains, and the possibility that this was the same bird was raised but not considered further by the Committee.

ZONE-TAILED HAWK *Buteo albonotatus*. One at Big Pine, INY, 10 Nov 1985 (86-1986). The Committee was almost unanimous in pointing out that other species of dark *Buteo* were not eliminated, in particular the Rough-legged Hawk (*B. lagopus*), which would have been a likely species at this locality in late autumn.

YELLOW RAIL *Coturnicops noveboracensis*. One at Coyote Hills Regional Park, ALA, 11 Nov 1973 (196-1986). One at Pescadero Beach, SM, 14 Apr 1986 (282-1986).

COMMON RINGED PLOVER *Charadrius hiaticula*. One at Southeast Farallon Island, SF, 12–14 Sep 1985 (13-1986).

The Committee and the observer, after circulation had already begun, were unanimous in the opinion that this was a juvenal-plumaged Semipalmated Plover (*C. semipalmatus*). The bird demonstrated some of the potential identification problems involved with this species pair. The extent of webbing between the middle and inner toes was clearly seen and seemed intermediate between that in the Semipalmated and that in the Common Ringed, which lacks this web or has only a minute one. This character and the call note—a mellow, rising whistle in Common Ringed—are the only features known to separate the two species in non-breeding plumages. Although other minor differences may distinguish the two on occasion, validation of any claimed Common Ringed Plover in California will require extensive documentation, including a careful description or recording of the call, details of the webbing between the toes, and plumage characters (for example, the face pattern, which is especially useful on alternate-plumage males).

BUFF-BREASTED SANDPIPER *Tryngites subruficollis*. One at Jacoby Creek, Humboldt Bay, HUM, 25 Aug 1970 (243-1986).

COMMON BLACK-HEADED GULL *Larus ridibundus*. One at Oakland, ALA, 4 Jan 1956 (220-1986). This report was published (McCaskie et al. 1979). The details obtained for this old report were insufficient to support the identification, but most members felt that it was probably correct.

MAGNIFICENT HUMMINGBIRD *Eugenes fulgens*. One at Ridgecrest, KER, 24 Apr 1984 (253-1984). A potential first state record, the majority (6–4) of the Committee accepted the report on its final round, and even more agreed that the description fit a male Magnificent Hummingbird. The bird was seen briefly at close range by a single person, apparently without binoculars, and was not described in detail. In the opinion of those not accepting this record, these circumstances were too tenuous to establish firmly a first state record. Further, it was pointed out that there are no verified lowland records for this species in Arizona (Monson and Phillips 1981), the species being found only at higher elevations in pine-oak woodland. There is one lowland report for Texas, of a male at San Antonio, 24–26 May 1959 (Oberholser 1974), and one for northeastern Kansas, Linn County (AOU 1983);

UNACCEPTED RECORDS, identification questionable (Cont.)

both are only sight records, however. Other extralimital records are from mountain areas in summer or fall, which is not surprising, since many species of hummingbird tend to migrate at higher elevation in fall. Since this species strays northward to the mountains of Colorado and Utah, a verified record for California is anticipated. This report from Ridgecrest was published (AmB 38:961).

The Magnificent Hummingbird has been reported previously three times from California as follows: an unreviewed report of a bird collected at San Gorgonio Pass, RIV, 15 Jul 1899 (Loomis 1902), and two reports for which the identification was not accepted (see Luther et al. 1979 and 1983). Grinnell and Miller (1944) included the San Gorgonio Pass bird on their supplementary list only, citing some doubt that the bird was actually collected in California (the specimen was 17394 at CAS but was destroyed by fire following the San Francisco earthquake in 1906).

GREEN KINGFISHER *Chloroceryle americana*. One at Tennessee Cove, MRN, 10–13 Sep 1986 (368-1986). The Committee unanimously agreed that the documentation did not support the identification. Additionally, the probability of this species reaching coastal northern California was felt to be exceedingly small. The Green Kingfisher has demonstrated only a slight tendency for vagrancy and is unrecorded from California, although Grinnell and Miller (1944) cited two reports in their supplementary list: one by Elliott Coues, who claimed to have observed it at several points along the Colorado River from Fort Mojave to Fort Yuma in 1865, and another at Poway, SD, a report they thought likely a misidentification (neither has been submitted to the Committee).

PHILADELPHIA VIREO *Vireo philadelphicus*. One at Arroyo Grande, SLO, 22 May 1982 (52-1982). One at Carpinteria, SBA, 15 Nov 1986 (471-1986). The Arroyo Grande report was previously accepted (Morlan 1985) but was reviewed again in light of the scarcity of spring records from the coast. A majority is required to overturn a previous acceptance.

YELLOW-GREEN VIREO *Vireo flavoviridis*. One at the Carmel River mouth, MTY, 2 Sep 1985 (28-1986).

KENTUCKY WARBLER *Oporornis formosus*. One at the Carmel River mouth, MTY, 2 Sep 1985 (145-1985).

COMMON GRACKLE *Quiscalus quiscula*. One at Furnace Creek Ranch, Death Valley NM, INY, 9 Oct 1979 (288-1986). This bird was not seen well enough for the observer to describe the back color or to reconfirm characters. The Great-tailed Grackle (*Q. mexicanus*) had already established itself at this locality, and many members felt that the chance of error was high given the brevity of the sighting. The Bronzed Grackle (*Q. q. versicolor*), which shows a contrasting, bronzy back color, is the only subspecies of Common Grackle known to occur in California.

COMMON REDPOLL *Carduelis flammea*. A flock of seven along the Shasta River near Edgewood, SIS, 21 Dec 1985 (206-1986). Although this sighting occurred immediately previous to other redpolls just to the northeast of this locality (see Accepted Records), the documentation failed to eliminate several other possible species, notably Cassin's Finch (*Carpodacus cassinii*).

UNACCEPTED RECORDS, natural occurrence questionable (identification accepted)

BARNACLE GOOSE *Branta leucopsis*. One was at Lower Klamath NWR, SIS, 18 Nov 1984 and 5–17 Apr 1985 (185-1986). A photograph was reportedly taken

UNACCEPTED RECORDS, natural occurrence questionable (identification accepted) (Cont.)

but is not with the record; the Committee would like to include this photograph with the file and requests that anyone having a photograph documenting this record contact the Secretary. A Barnacle Goose reported near Colusa, COL, 7–10 Dec 1984 and later near Modesto, STA, 12–21 Dec 1984 were presumed to involve the same individual as the Klamath bird (AmB 39:345), but the Committee did not review details of these sightings. A Barnacle Goose, presumably the same bird again, was reported in nearby southern Oregon shortly after the last sighting in California, but again no details have been reviewed. We would appreciate anyone having notes on these reports sending them to the Secretary.

The Klamath bird associated with a flock of Greater White-fronted Geese (*Anser albifrons*) and a few Cackling Canada Geese (*B. canadensis minima*) and was not considered tame. Nevertheless, the Committee unanimously agreed that Barnacle Goose is not a reasonable candidate for vagrancy to western North America and chose not to admit this species to the state list.

The Barnacle Goose's normal wintering grounds are on coastal bluffs and islands of northern Great Britain and Ireland, with a separate group wintering in the Netherlands. While a dislocation of this distance is not unprecedented (see the report of an Aleutian Tern in Great Britain, Dixey 1981), it is highly unlikely and is made even more suspect by the popularity of this species with aviculturalists, who commonly raise this goose in captivity, from which it frequently escapes. These escapes are capable of long-distance dispersal, often flocking with other geese, especially the Canada Goose. Barnacle Geese have been reported across North America, and mated pairs of Canada and Barnacle Goose are seen occasionally. An interesting case of this involved a Barnacle Goose mated with a Richardson's Canada Goose (*B. c. hutchinsii*) and seen with two hybrid offspring in Connecticut from 22 Nov 1984 to 10 Jan 1985 (Szantyr 1985). Since Richardson's Goose breeds along the eastern coastline of the District of Keewatin and western Baffin Island in the Northwest Territories, this pair probably migrated at least 2,000 miles together each direction. This Barnacle Goose was presumed to be an escaped bird now traveling with Canada Geese, much as the California bird did. A Barnacle Goose seen at Palmer, Alaska (near Anchorage), 22 Apr–12 May 1985 (AmB 39:338), only five days after the California bird was last seen, was widely presumed to be the same individual because Cackling Geese are known to migrate to Alaska non-stop from the Klamath Basin in about 40 hours (M. J. Lippsmeyer in litt.). However, the date that the Barnacle Goose was last seen in Oregon is unknown, and if later than the Alaska individual, then obviously a different was bird was involved.

The Barnacle Goose has occurred naturally in North America, as demonstrated by a pair shot in the late fall of 1981 on the northeast coast of Newfoundland, the male banded in Spitsbergen, a Norwegian archipelago about 360 miles north of mainland Norway (Montevecchi and Wells 1984). On the other hand, Ryff (1984) argued against the natural occurrence of most North American birds, referring especially to the numbers held in captivity and the tendency for this species to migrate strictly between Greenland and western Europe. A point missed by Ryff and favoring the potential for vagrancy to North America was that another species of goose follows a similar migration route and yet does stray to this continent. The race of Greater White-fronted Goose (*A. a. flavirostris*) that breeds in western Greenland and winters in Great Britain and Ireland is a rare but regular visitor to the northeast states and provinces. Another trans-Atlantic migrant that winters in the same areas as the Barnacle Goose is the subspecies of the Brant, *B. bernicla hrota*, that breeds on Canadian arctic islands. While this subspecies winters primarily on the east coast of North America, a portion of the population regularly migrates to Ireland for the

UNACCEPTED RECORDS, natural occurrence questionable (identification accepted) (Cont.)

winter (Cramp and Simmons 1977), thus offering a group of birds that could lead a Barnacle Goose to this continent. The western North American subspecies of the Brant, *B. b. nigricans*, is also a regular but rare vagrant to western Europe and another example of a goose that can successfully navigate the passage between the two continents.

Although the California record is not accepted, it is still important to document records of Barnacle Goose because new information may change our view, but for now, the safest approach is to treat these birds as probable escapees.

*NORTHERN CARDINAL *Cardinalis cardinalis*. An adult male was near Imperial Beach, SD, 13–14 Oct 1962 (217-1986). Reports of escaped Northern Cardinals are not infrequent, and the reader is referred to the account for this species under Accepted Records for more information.

CORRIGENDA TO TENTH REPORT (Dunn 1988)

Under Accepted Records: Record 94-1985 (Spotted Redshank) should indicate the bird's presence at Elk Creek in Crescent City harbor, 14 May 1985, and at the mouth of Jordan Creek (not Elk Creek as published) on Lake Earl, 15 May. The caption to figure 8 on page 147 (Scissor-tailed Flycatcher, record 56-1985) shows the wrong date; the correct date is 26 May 1985 (not 2 May as published). Record 275-1984 (Gray Catbird) should indicate the year as 1984.

Under Unaccepted Records, Identification Questionable: Record 111-1985 (Yellow-billed Loon) has the locality misspelled; the birds were reported off Endert Beach (not Erdent Beach).

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ACKNOWLEDGMENTS

The 166 contributors named above made this report possible, and the Committee greatly appreciates their support. Those who submitted photographs are especially thanked, and their contributions enhance this report. Critical analysis and advice, for which the Committee is most grateful, was received from the late Peter Grant, John Marchant, Ron Naveen, Nancy L. Newfield, and J. V. Remsen, Jr. Special thanks go to Gary S. Lester and Richard E. Webster for examining and photographing specimens. The following museum curators and collections managers provided assistance with collections under their care: Stephen F. Bailey (CAS), George A. Clark, Jr. (Connecticut State Museum of Natural History), Shirley Harding (DVNMM), and Amadeo Rea (SDNHM). Many past Committee members voted on the records contained in this report, but a large number of these were reviewed by Laurence C. Binford, Benjamin D. Parmeter, and Rich Stallcup. Finally, I thank my fellow committee members for reviewing and improving this report. Those members, past and present, are Stephen F. Bailey, Jon L. Dunn, Richard A. Erickson, Kimball L. Garrett, Jeri M. Langham, Paul E. Lehman, Michael J. Lippsmeyer, Curtis Marantz, R. Guy McCaskie, Joseph Morlan, Peter Pyle, and Don Roberson.

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Accepted 18 July 1990

NOTES

OBSERVATIONS ON ISLA GUADALUPE IN NOVEMBER 1989

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Isla Guadalupe (29° N, 118° 17' W) is located off the west coast of Baja California, México. The history and status of its avifauna, as well as a brief description of the island, have been given by Jehl and Everett (1985). Additional recent observations have been reported by Dunlap (1988) and Oberbauer et al. (1989).

In this note we report on birds observed on and near Isla Guadalupe on 23 November 1989. Our time ashore lasted from 1000 to 1500 hours, during which we traveled about 60 km (round trip) by car from Melpomene Cove, at the southern end of the island, to the large barren area north of the remnant of the cypress forest, in the high central region. En route we also visited Campamento Weste.

At the start of the trip air temperature was in the low 20s (°C) and the visibility was several kilometers. By the time we arrived at the cypress forest, the temperature had dropped several degrees and become cold, it was misty and windy, and visibility had decreased to 100 meters.

An annotated list of birds observed is presented below:

Laysan Albatross (*Diomedea immutabilis*). We saw four individuals roosting on a barren rocky area at Melpomene Cove, while two were flying over. A breeding colony was discovered in the same place in 1986 (Dunlap 1988) and discussed by Everett (1988). This same colony was also reported on by Pitman (1988) and Oberbauer et al. (1989). We assumed that the birds sitting on the ground were incubating but did not attempt to confirm this because of possible disturbance.

Leach's Storm-Petrel (*Oceanodroma leucorhoa*). We saw several individuals flying close to the ship at night, near the north end of the island. These storm-petrels are regular breeders in the area, and their status was discussed by Jehl and Everett (1985).

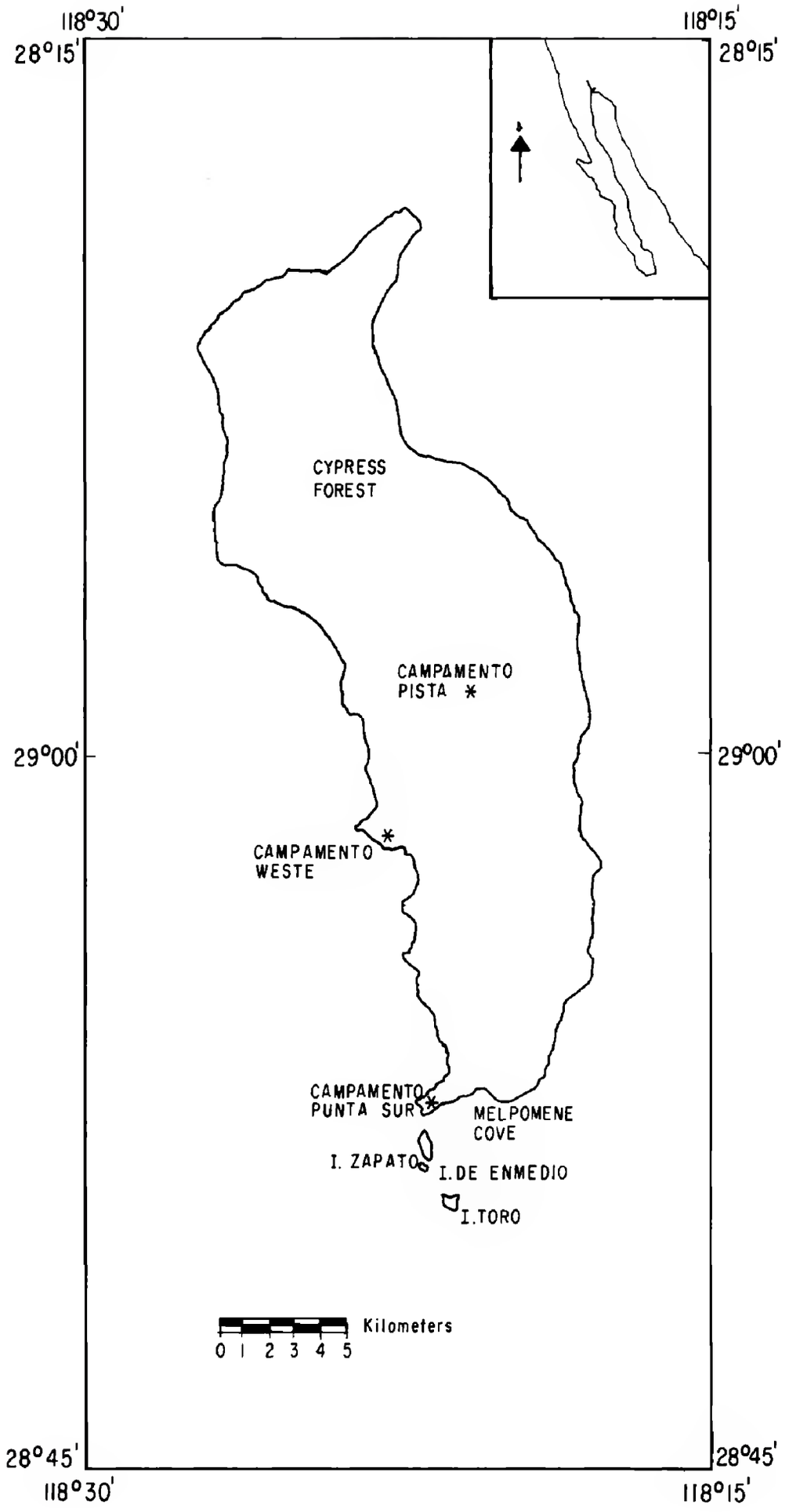
American Kestrel (*Falco sparverius*). Several individuals, both females and males, were seen along the road. This is a common species of the island (Jehl and Everett 1985).

Killdeer (*Charadrius vociferus*). We saw two on the sandy beach of Campamento Weste.

Ring-billed Gull (*Larus delawarensis*). We saw a few flying between Isla Zapato and Isla Toro off the south end of the main island, in a mixed flock with Western Gulls (*Larus occidentalis*). These gulls were identified by their pale mantle, small size, and ringed yellow bill. Jehl and Everett (1985) reported only two previous sight records, one of them questionable.

Western Gull (*Larus occidentalis*). This species is resident on the island (Jehl and Everett 1985), but its abundance may be augmented by mainland birds during the winter (W. T. Everett pers. comm.). We saw several between Isla Zapato and Isla Toro.

White-winged Dove (*Zenaida asiatica*). We saw two individuals near Campamento Pista, in the high central area, on rocky ground with some herbaceous cover. This species has been collected only once on the island, on 10 June 1953 (Howell and Cade 1953).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118°15'

Mourning Dove (*Zenaida macroura*). This is a common resident of the island (Jehl and Everett 1985). We saw several near Campamento Pista, in rocky herbaceous habitat.

Rock Wren (*Salpinctes obsoletus*). Although this species is reportedly abundant on the island (Jehl and Everett 1985), we saw only two individuals: one at Campamento Punta Sur and one in a barren area north of the cypress forest.

Varied Thrush (*Ixoreus naevius*). We saw a male standing on small rocks at the side of the road in a barren area between Campamento Pista and the cypress forest. The only other record is of a male observed on 4 March 1886 (Bryant 1887).

Mockingbird (*Mimus polyglottos*). This seems to be a rare species on the island (Jehl and Everett 1985). We saw one individual in a eucalyptus tree at Campamento Pista.

Phainopepla (*Phainopepla nitens*). This is a new species for the island. We saw a male and a female near the small water pond (about 100 square meters) by Campamento Pista.

European Starling (*Sturnus vulgaris*). Several at Campamento Pista, in a mixed flock (about 15 individuals of each species) with Brown-headed Cowbirds (*Molothrus ater*).

Warbler (*Dendroica* sp.). A *Dendroica* warbler of undetermined species in a eucalyptus tree at Campamento Pista.

White-crowned Sparrrow (*Zonotrichia leucophrys*). One individual in a eucalyptus tree at Campamento Pista. This is the second Guadalupe record for the species, although it is probably regular in migration (Jehl and Everett 1985).

Guadalupe Dark-eyed Junco (*Junco hyemalis insularis*). Two individuals in the cypress forest.

Western Meadowlark (*Sturnella neglecta*). One individual seen on a barbed wire fence near Campamento Pista, and another heard in the old goat fence-trap, approximately halfway between Melpomene Cove and Campamento Pista, on the high central area. This species has not been recorded on the island since 22 March 1886 (Bryant 1887).

Brown-headed Cowbird (*Molothrus ater*). Several individuals at Campamento Pista, mixed with the starlings. This species is new to the list of birds of the island.

House Finch (*Carpodacus mexicanus*). Several on a barbed wire fence near Campamento Pista.

The locality at which we recorded the highest number of bird species was Campamento Pista. This camp is inhabited by a marine in charge of the landing strip, and includes a few huts and a garden with some eucalyptus trees and other introduced plants. It also had, at the time of the visit, a water pond nearby. These two facts likely contributed to the variety of birds at the site. Our observations add two species to the island's list of known birds, and include some not recorded since the end of the last century and others considered rare.

Habitat destruction by goats and predation by feral cats have been important factors in causing the extinction of some birds and decimation of the populations of others (Howell and Cade 1954). We observed many goats (between 200 and 300 animals, in four herds) over the entire area, except near Melpomene Cove. The goats were very wary, as a result of continuous, though low-intensity, hunting. We saw also two packs of feral dogs (three and seven animals). These are said to be very aggressive, and are surely another important factor of predation.

← Figure 1. Isla Guadalupe, Baja California, Mexico, showing localities visited on 23 November 1989.

NOTES

This trip would not have been possible without the kind support of the Armada de México and captain and marines of the Coast Guard ship *Altamirano*, who allowed us to travel with them to and from the island, and transported us by car on our field trip. We thank William T. Everett and Philip Unitt for their thorough review of this paper.

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Accepted 23 October 1990

PEREGRINE FALCONS NESTING IN SAN DIEGO, CALIFORNIA

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Thirty-nine years after the last Peregrine Falcon (*Falco peregrinus anatum*) nest was documented in San Diego County, a pair has bred successfully on the Coronado Bay Bridge. Peregrines originally numbered between 100 and 300 nesting pairs in California with four to six pairs per year in San Diego County (Bond 1946, Cade et al. 1988). Prior to 1948 active nests existed at Point Loma, La Jolla cliffs, San Pasqual, and Morro Hill (collected eggs in the Western Foundation of Vertebrate Zoology), San Onofre (Dixon 1906), Pala and Santa Margarita river estuary (Dixon 1917), Escondido (Sharp 1919), and the nearby Los Coronados Islands (Howell 1910). In the 1950s, however, Peregrine numbers plummeted primarily because of egg shell thinning caused by widespread use of organochlorine pesticides, especially DDT (Hickey 1969, Ratcliffe 1980). The last recorded sign of a breeding Peregrine in San Diego was a single egg collected from a "sea wall" in 1950 (Western Foundation of Vertebrate Zoology). By 1970, the California Peregrine population had been reduced by over 95% to only two known nesting pairs, neither in San Diego (Herman 1971).

On 14 April 1989 I found a Peregrine Falcon nest under the eastern, or San Diego, portion of the Coronado Bay Bridge, the bridge that crosses San Diego Bay and joins San Diego with Coronado. After notifying California Department of Fish and Game and U.S. Fish and Wildlife Service officials of the discovery, I obtained permission from the California Department of Transportation (Caltrans) to be escorted along the catwalk beneath the bridge to investigate the status of the nest. On 18 April 1989 I observed four nestlings from a ledge beneath the catwalk, and estimated that they were one and a half to two weeks old. Photographs of the nest and young were taken with a Nikon FM camera equipped with a 1600-mm lens and Kodak T-Max 3200 film pushed to 12,800 ASA. Photographs of the adults (Figure 1) were taken with Kodak Ektar 1000 film. Photographs are on file at the Santa Cruz Predatory Bird Research Group (SCPBRG) University of California, Santa Cruz, and the San Diego Natural History Museum.

On 20 April 1989 I arranged for a representative from the Peregrine Fund, Dan Brimm, to meet with Caltrans officials to view the nest and recommend a management plan. As a result, the portion of catwalk nearest the nest was closed.

Photographs of the adult female showed a scarred right eye, a USFWS aluminum band, and a defunct leg-mounted radio transmitter, positively identifying the bird as one released by SCPBRG at Point Loma in 1986. As part of a joint reintroduction program with the Peregrine Fund, SCPBRG released 12 Peregrines, all of which reached independence, at Point Loma between 1982 and 1988 (Linthicum 1989, Brian Walton pers. comm.). The male was unbanded and very pale.

The nest was on the east-facing, or leeward, side of bridge support tower number 31 approximately 90 feet above ground level. It was a scrape in what appeared to be 1 inch of pigeon feces and accumulated dust. The ledge was about 12 to 14 inches wide and 6 feet long. The nest was visible only from a single point beneath the catwalk, 196 feet away, and was inaccessible without specialized equipment.

On 14 May 1989 two of the four young, both males, fledged successfully. A third, the only female, fledged and collided with the San Diego Trolley. It suffered only superficial damage and was placed on the catwalk beneath the bridge near the nest ledge the following day. Two days later one of the juvenile males failed in an attempt to land atop the nesting tower and slid down the concrete face to the ground. The bird suffered a broken wing. The wing was taped by veterinarians at the San Diego Zoo and the bird was shipped to SCPBRG for rehabilitation. The fourth young, also male, fledged on 20 May. The three remaining young were fed for several weeks by the adults and appeared to reach independence (Dan Brimm pers. comm., pers. obs.).

The pair of adults returned to the Coronado Bridge in 1990 and hatched three young. During early May (before the 11th; exact date lost, John P. Reiger pers. comm.), one of the young, a male, was struck by a vehicle crossing the bridge. It was killed on impact. Philip Unitt prepared it as a study skin and partial skeleton, catalogue number 46702, San Diego Natural History Museum. On 10 May, a second young, a female, either fledged prematurely or fell from the nest and landed on the ground. It was taken to the San Diego Zoo where tests revealed no injuries. The following day, the third young, a female, also left the nest and fell to the ground. The two surviving young were taken to SCPBRG, then released in Yosemite National Park on 20 May. After release, one was killed by a Golden Eagle (*Aquila chrysaetos*) prior to reaching complete independence; the other one dispersed (Linthicum and Walton 1990).

I thank Mike Couffer for photographic assistance and Brian J. Walton for helpful review of the manuscript.

Figure 1. Female Peregrine Falcon that nested at San Diego in 1989 and 1990, identified as one of three released in 1986 at Point Loma, only four miles from the nesting site, by its USFWS band, leg-mounted radio transmitter, and scarred right eye.

Photo by Mike Couffer

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Accepted 12 January 1991

FIRST RECORD OF THE WESTERN KINGBIRD (*TYRANNUS VERTICALIS*) IN BAJA CALIFORNIA SUR

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The Western Kingbird (*Tyrannus verticalis*) is the most widespread kingbird in the western USA, being common in dry and open country (Peterson 1990). Its breeding distribution ranges from southern Canada to northern Mexico, and it winters south to Costa Rica (Peterson and Chalif 1973). In Baja California, the Western Kingbird is considered a spring transient and summer resident species in the north (Wilbur 1987), being recorded south just to El Salto and Rancho Rosarito (30° 25′ N, 115° 25′ W) (Short and Banks 1965). However, on 29 September 1990 we recorded two individuals of the species in the southern tip of the peninsula. The birds were perched on fences and mesquites, catching insects at Ejido La Trinidad (37.5 km south of La Paz; 23° 48′ N, 110° 19′ W), where disturbed areas surrounded by open woodland and field crops dominated the landscape. Vegetation of the area was composed of mesquite (*Prosopis articulata*), Choya (*Opuntia cholla*), palo verde (*Cercidium praecox*), Tacote (*Viguiera deltoidea*), and isolated Dagger Cactus (*Machaerocereus gummosus*), Organ Pipe Cactus (*Lemaireocereus thurberi*), and Cardon (*Pachycereus pringlei*).

We recognized these Western Kingbirds by their bright lemon yellow bellies, pale grayish throats and breasts, and gray heads, and particularly by the narrow white edging on each side of their black tails. The white edges on the outer feathers of the tail helped us to differentiate this species from Cassin's Kingbird (*Tyrannus vociferans*), a regular winter visitor to Baja California Sur.

Our records suggest that Western Kingbirds in the southern tip of Baja California must have been overlooked before. The avifauna of Baja California, especially of the southern part of the peninsula, has not been very well determined, and we want to call attention to the need for more intensive studies year round, mainly in the winter season, because Baja California Sur seems to receive a considerable number of overwintering bird species (Rodriguez 1988).

We thank Amado, Franco, and Abelino Cota and Marcos Acevedo for field company. Support was provided by Centro de Investigaciones Biológicas, Secretaría de Programación y Presupuesto, and Consejo Nacional de Ciencia y Tecnología.

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Accepted 1 December 1990

CORRIGENDUM

Owing to a printer's error at the final stage of production, Figure 10 in "The Taxonomy, Distribution, and Status of Coastal California Cactus Wrens," by Amadeo M. Rea and Kenneth L. Weaver (*Western Birds* 21: 81-126, 1990) was replaced by a duplicate copy of Figure 11. The correct Figure 10, with its legend, appears below. Also, in the tabulation on page 94, the numeral "22" should be "2." The sum is correct. *Western Birds* regrets these errors.

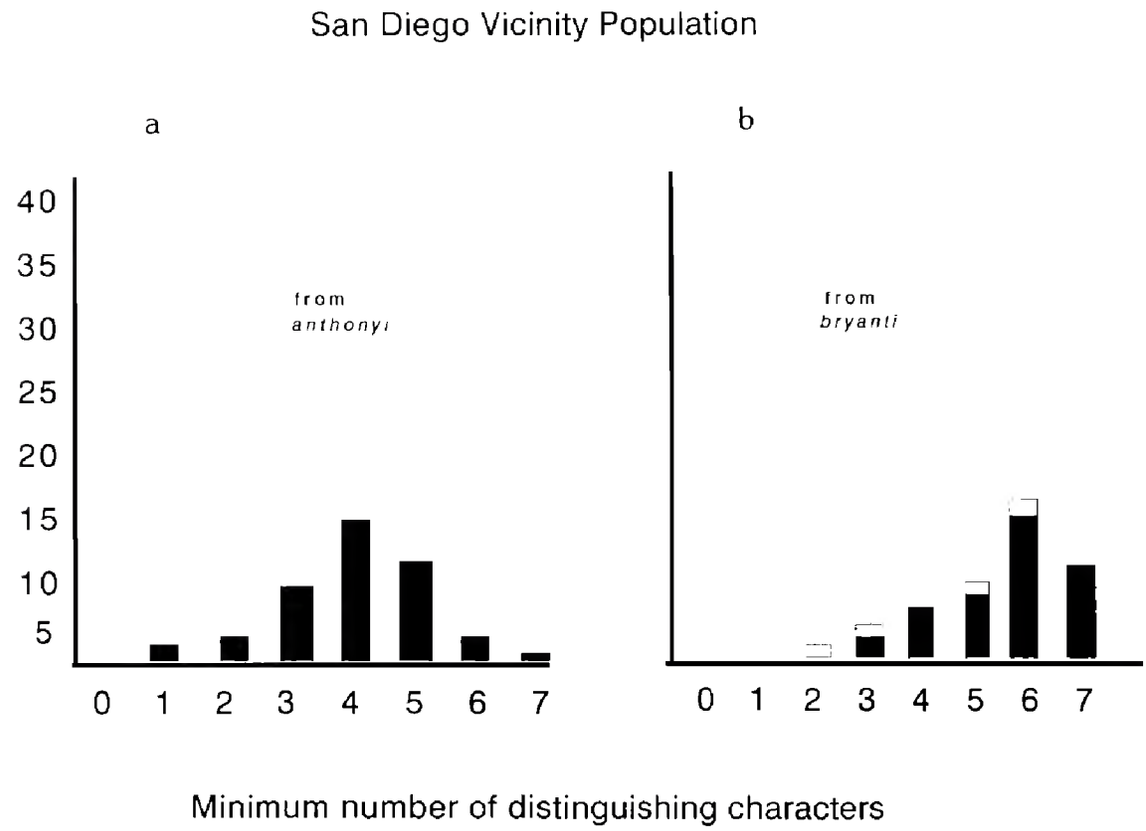

Figure 10. Number of characters (horizontal axis) distinguishing the San Diego-area population of the Cactus Wren (*C. b. sandiegensis*) from desert *anthonyi* (left) and peninsular *bryanti* (right). (Number of individuals on vertical axis.) Black bars, specimens scored for all possible character states; white bars, defective specimens lacking scores for one or more character states.

All but six specimens from the San Diego area were distinguishable from desert *anthonyi* on the basis of three or more characters, while all but two were distinguishable from peninsular *bryanti* on the basis of three or more characters (four specimens could not be scored for all characters).

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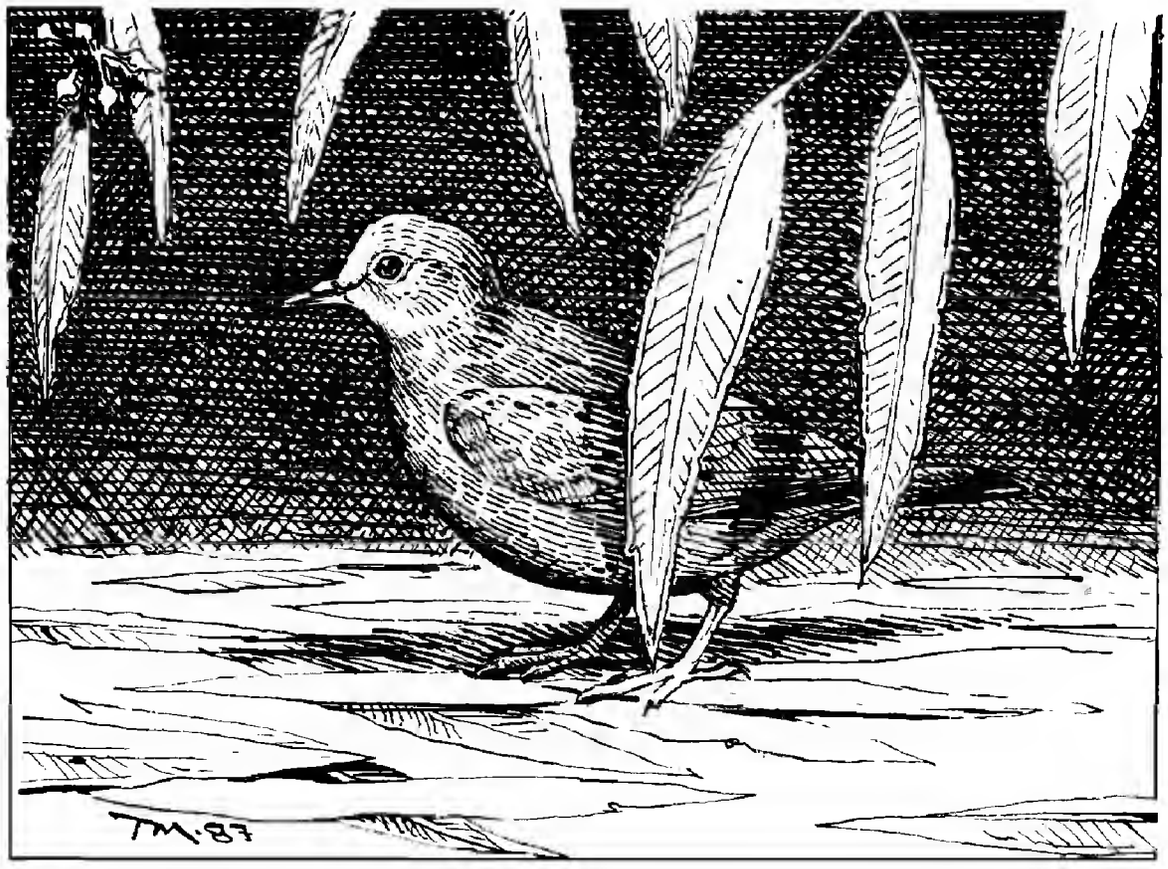

Ruddy Ground-Dove *Sketch by Tim Manolis*

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Cover photo courtesy of Sea & Sage Audubon Nature Library/photo by James R. Gallagher: Red-breasted Sapsucker *(Sphyrapicus ruber daggetti)*, San Bernardino Mountains, California.

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